Part XVII — Price 9s

THE

FLORA OF BRITISH INDIA.

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LONDON

L. REEVE & CO 5 HENRIETTA STREET COVENT GARDEN

1890.

UPPER BURMA, at Maypongo, *Herb Hort Calcutt*

Tuber globose *Stem* 4–6 in *Leaves* 2, linear lanceolate, acuminate *Scape* with the raceme 18 in sheaths 2 acuminate, raceme 6–8 fld, bracts ¾ 1 in membranous linear lanceolate, subspathaceous, flowers 1 in diam, lateral sepals inserted at the base of the column, lip shorter than the sepals, hypochile obovate as long as the rather narrower epichile, spur short cylindric, column rather long

6 **E. bracteosa,** *Lindl in Wall Cat* 7366, *Gen & Sp Orchid* 180, *in Journ Linn Soc* iii 23, bracts very long sepals oblong, tip rounded, petals broadly obovate very many-nerved, lip narrowly obovate oblong, obscurely 3 lobed, disk with 5 crenulate veins E grandiflora, *Lindl Gen & Sp Orchid* 181

KHASIA HILLS, on the north slopes, alt 3–4000 ft, *J D H & T T* CHITTAGONG, *Wallich* TENASSERIM alt 3500 ft *Parish*

Stem 4–6 in sheathed *Leaves* 1 3 10–18 in linear lanceolate petioled, 3 nerved *Scape* stout, shorter than the leaves clothed with long sheaths, raceme short, few fld, flowers fleshy, bracts 1–1½ in, sepals ¾ in yellow, lip white or lilac streaked, spur short obtuse *Capsule* 1 in —Lindley s habitat of Ceylon for *grandiflora* is no doubt an error

7 **E. elata,** *Hook f*, bracts equalling the ovaries, sepals falcate lanceolate acuminate 5 nerved petals elliptic lanceolate obtuse strongly 5 nerved, lip narrowly ovate oblong obtuse entire, disk with 3 slender moniliform nerves

PERAK, *Scortechini*, 2023

Leaves 12 14 in, petioled elongate, linear lanceolate *Scape* 3½ ft very stout below, sheaths appressed, raceme elongate lax fld bracts ¼ ½ in sepals as long, fleshy, lip equalling the sepals, spur a small sac, column short, stout, hooded young fruit 2 in, deflexed

8 **E. explanata,** *Lindl Gen & Sp Orchid* 180, bracts shorter

NEPAL, at Mighada, in the Morung *Hamilton* NORTH WEST INDIA (*Ic Falconer*)

conical, obtuse, column very short —An anomalous species Lindley s specimens being counterparts of Hamilton s, his Ceylon habitat is doubtless an error

§§ *Lip broader than long, side lobes short or 0*

NORTH WEST INDIA, on the banks of the Tonse river, *Royle*

Leaves 12 in, narrowly ensiform *Scape* very tall, raceme elongate, lax fld, bracts ½ ¼ in, ovate lanceolate, acuminate sepals ¾ in petals rather shorter, but

much broader, lip as long as the sepals, spur conic acute, curved, placed between the lateral lobes, column short stout —Placed by Lindley in *Cyrtopera* but there is no foot to the column, he also errs in describing the sepals and bracts as obtuse

10 E. pratensis, ...

circular, disk with three crenate nerves ending in crenate calli on the mid lobe *Dalz & Gibs Bomb Fl* 265 E ramentacea, *Wight Ic* t 1666 (*not of Lindl*)

The DECCAN PENINSULA, in pastures from the Concan southwards

Leaves few 10–12 in, long petioled narrowly lanceolate strongly 3 nerved *Scape* 1–3 ft, sheaths acute, appressed bracts ½–¾ in ovate-lanceolate, sepals ¾ in, fleshy, spur conical acute *Capsule* 1½ in, elliptic, turgid —The broad lip is like that of *E macrostachya* Lindley and the Bombay Flora err in describing this species as leafless when flowering

11 **E. macrostachya,** *Lindl Gen & Sp Orchid* 183, *in Bot Reg* t 1972, bracts lanceolate sepals lanceolate acute petals rather broader, lip broader than long, side lobes short obtuse midlobe revolute rounded, disk 2 lamellate at the base *Bot Reg* t 1972, *Bot Mag* t 6246, *Wight Ic* t 1667–8, *Walp Ann* vi 646

TRAVANCORE and NILGHIRI HILLS *Wight* CEYLON, in the Central Province, ascending to 4000 ft, *Thwaites* &c

Pseudobulb 2–6 in fusiform *Leaves* 3 6–10 in, petioled, elliptic lanceolate, 3 nerved *Scape* stout and raceme together 2–3 ft, sheaths appressed, obtuse, bracts caducous, sepals and petals ½ in, green, lip golden yellow with red stripes, spur a 2-lobed green sac *Capsule* 2 in

12 **E. Mannii,** *Hook f Ic Plant ined*, scape tall, raceme many fld, bracts shorter than the ovary, sepals oblong lanceolate acute many nerved, petals broader elliptic many nerved, lip rhomboidly ovate obtuse obscurely lobed, disk with branching crested nerves Cyrtopera Mannii, *Reichb f in Flora* 1872, 274

UPPER ASSAM, *Mann*

Leaves 12 by ½ in, narrowly linear lanceolate *Scape* with raceme 3 ft, sheaths appressed, acute bracts ½–⅓ in, ovate lanceolate, sepals ¾ in long lip shorter, spur conical, column short, clavate

** Flowers appearing long before the leaves (I have not seen the leaves of any species of this subdivision)

13 **E. campestris,** *Wall Cat* 7... fld, sepals ½–⅔ in linear lanceolat... 3–5 nerved, lip cuneate-obovate or ... lar quadrate or oblong crenulate ... central nerves lamellate at the base and tubercled or spinulose on the midlobe *Lindl Gen & Sp Orchid* 185, *in Journ Linn Soc* iii 24 (*excl syn Wight*), *Walp Ann* vi 647. E ramentacea & rupestris *Lindl in Wall Cat* 7367, 7368, *Gen & Sp Orchid* 185, *in Journ Linn Soc* iii 25 E hemileuca, *Lindl in Journ Linn Soc* iii 25 Limodorum ramentaceum, *Roxb Hort Beng* 63, *Fl Ind* iii 467 L dulium, *Ham mss* Bletia Dabia, *Don Prodr* 30 Dipodium ramentaceum, *Herb Ham*

PLAINS OF INDIA; from the Panjab to Oudh, Bengal, Chittagong, and the Deccan —DISTRIB Affghanistan

Scape 6–18 in, stout or slender from a deformed tuber, sheaths sub[illegible]ssed acute, flowers many, subsecund, sepals slightly attached to the base of the lip, variable in breadth, acute or acuminate, yellow or green striped with pink, petals narrower, lip as long as the sepals, side lobes rounded or subacute, midlobe usually purple, spur conical subclavate or subacute column rather slender *Capsule* ¾ in, ellipsoid.—The lip of *E hemileuca* is rather tubercled than spinulose

14 **E. stenopetala,** *Lindl in Journ Linn Soc* iii 26, scape sheaths loose, bracts longer than the ovaries, raceme few fld, sepals ½ in linear oblong 5 nerved, petals lanceolate acuminate 3 nerved lip broadly cuneate, side lobes rounded much larger than the suborbicular crisped midlobe, disk with 3 nerves tubercled between the side lobes and on the midlobe

BHOTAN HIMALAYA, dry hills at Punakha *Griffith*

Scape 12–18 in, slender, sheaths obtuse, bracts ½–⅔ in, lip as long as the sepals, spur clavellate —Specimens indifferent Very near *E campestris*, but the lip is much broader and side lobes more spreading

15 **E. decipiens,** *Griff in Journ As Soc Beng* xlvii 155, t 13 f 8–12, flowers secund bracts minute, sepals and petals ½ in linear hardly falcate acute 5 nerved, lip obovate concave 3 lobed above the middle, midlobe much the largest, margin crisped, disk 5 nerved at the base, 10–13 nerved in the middle of which 4 5 form fleshy fibres on the midlobe, spur short slender saccate

NICOBAR ISLANDS, at Kamorta, *Kurz*

Scape 2–3 ft; root tuberous, sheaths small, lanceolate *Leaves* not seen *Raceme* 3–4 in; pedicel with ovary ¼–½ in, sepals and petals white, spur $\frac{1}{12}$ in — 'Closely resembles *Pachystoma senile*, but pollinia of *Eulophia*' I have seen no specimens

16 **E. densiflora,** *Lindl in Journ Linn Soc* iii 25, scape robust, bracts shorter than the ovaries, sepals 1–1½ in narrowly oblanceolate acuminate petals narrower, lip obovate oblong, side lobes small rounded, midlobe orbicular, disk with 3 lamelliform nerves which are crenate or interrupted from the middle to near the apex, spur long slender

SIKKIM HIMALAYA, at the foot of the hills, *J D H* BHOTAN, *Griffith*

Scape 1–3 ft, from a depressed tuber, lower sheaths obtuse, upper acuminate, raceme many-fld, flowers secund, deflexed very narrow, column short —The long narrow flowers are very characteristic of this species

17 **E. burmanica,** *Hook f*, scape robust, sheaths short loose, raceme many- and dense fld, bracts filiform equalling the ovary, sepals ⅓ in oblong obtuse many nerved, petals narrower 3-nerved, lip cuneately obovate, side lobes short rounded, midlobe small ovate, disk with 2 caruncalate nerves

[illegible]

Sect II **Cyrtopera.** *Column* produced into a foot.

* *Lateral sepals inserted on the spur of the lip (see also* C explanata)

18 **E. nuda,** *Lindl in Wall Cat* 7371, *Gen & Sp Orchid* 180, tall, raceme elongate many fld., bracts various, flowers large green

or purple, sepals linear-oblong acute, petals shorter elliptic oblong many nerved, lip obovate-oblong obtuse, side lobes obscure, midlobe rounded or retuse crisped, disk crested with many crenulate or tubercled nerves E bicolor, *Dalz in Hook Kew Journ Bot* iii (1857) 343, *Dalz & Gibs Bomb Fl* 264, *Walp Ann* vi 647 Cyrtopera fusca, *Wight Ic* t 1690, *Lindl in Journ Linn Soc* iii 31, *Thwaites Enum* 429, *Walp l c* 668 C plicata, *Lindl in Wall Cat* 7362, *Gen & Sp Orchid* 190 C nuda, *Reichb f in Flora* 1872 274 C Gardneri *Thwaites Enum* 302. C mysorensis, *Lindl in Journ Linn. Soc* iii 32 C laxiflora *Gardn mss* Dipodium Roxburghii & plicatum, *Herb Ham*—? *Rheede Hort Malab* xii t. 26

TROPICAL HIMALAYA, from Nepal eastwards, ASSAM, the Khasia Hills, MUNNIPORE, PEGU and TENASSERIM UPPER BURMA (*Herb Hort Calcut*) The DECCAN PENINSULA, from the Concan southwards CEYLON, in the Central Province

Tuber large *Leaves* 10–14 in, elliptic lanceolate, very variable in breadth *Scape* 1–3 ft, stout, sheaths appressed bracts rarely equalling the ovary, sepals 1 in; mentum rounded or conical, lip shorter than the sepals *Capsule* $1\frac{1}{2}$ in, fusiform —T[illegible]

[illegible]

19 **E. squalida,** *Lindl in Bot Reg* 1841, *Misc* 77, raceme elongate many fld, bracts equalling the ovary, sepals oblong-lanceolate acuminate, petals elliptic-oblong many nerved, lip as broad as long sub equally 3-lobed strongly closely nerved midlobe crisped retuse, disk naked Cyrtopera squalida, *Reichb f in Bonpland* 1857, 38, *Lindl in Journ Linn Soc* iii 31, *Walp Ann* vi 668

PENANG; on Govt. Hill, *Curtis* SINGAPORE, *Ridley*—DISTRIB Malay Islands

Stem rooting from the base without a tuber *Leaves* 8–12 by $1\frac{1}{2}$–2 in, narrowly lanceolate, some long petioled *Scape* 18–24 in, stout or slender, sheaths appressed, sepals $\frac{3}{4}$–1 in long, lip $\frac{3}{4}$ in across the side lobes, base rounded; mentum conical

** *Lateral sepals inserted on the foot of the column, free of the spur of the lip or nearly so*

[illegible] oblong densely many-fld, [illegible] shorter broader many-nerved, [illegible] large orbicular crisped, two [illegible] se of the disk and with the [illegible] topera bicarinata, *Lindl in* [illegible], *in Journ Linn Soc* iii 31 (*excl cit Ic Griff.*) Epipactis ? bicarinata *Herb Ham* Cymbidium, *Griff Notul* iii 343, No 9, *Ic Plant Asiat* t 320, f 3 (*pollen*)

SIKKIM HIMALAYA, *Gamble* ASSAM, *Hamilton* KHASIA HILLS, alt 2–3000 ft, *Clarke* MUNNIPORE, *Watt* UPPER BURMA, *Griffith*

Flowering before leafing *Scape* 8–30 in, stout or slender; sheaths inflated; bracts slender, short or long, flowers resupinate, purplish brown, greenish or yellowish, sepals $1\frac{1}{4}$ in long; lip longer than the sepals, tip rounded or notched, spur conical obtuse —*Flowers* often streaked with pink I have not seen leaves, and Griff h d es not describe them, he says the flowers are purplish brown and the lip broadly obtusely spurred

21 **E. candida,** *Hook f*, flowering with the leaves, scape slender,

raceme short many fld , bracts shorter than the ovary, sepals linear oblong petals shorter elliptic obtuse, side lobes of lip short, midlobe large orbicular crisped, nerves of disk as in *E bicarinata* Cyrtopera candida, *Lindl in Journ Linn Soc* iii 31 (*in part*)

SIKKIM HIMALAYA alt 3–4000 ft , *J D H* ASSAM *Mann*
Flowering before leafing *Leaves* 8 18 by 3 3½ in , elliptic lanceolate, caudate 5 nerved petiole 6–8 in , slender *Scape* 18–24 in , sheaths rather loose raceme 3–4 in , bracts ⅓–½ in more turgid than in *E bicarinata*, flowers 1¼ in diam , white or greenish, spur conical *Capsule* 1 in , narrowly ellipsoid — Perhaps a var of *E bicarinata* Lindley's description is taken from a specimen gathered by myself and a drawing of *E nuda* (Ic Cathcart), from which the root, the colour and the anther are taken

22 **E. flava,** *Hook f* , ...

Reichb f in Gard. Chron
Walp Ann vi 667 Dipodium flavum, *Herb Ham*

WESTERN TROPICAL HIMALAYA, *from Garwhal, alt 4–5000 ft , to Nepal* TRAVANCORE, *Cullen* —DISTRIB Hong Kong
Flowering before leafing *Scape* 2–5 ft , as thick as the finger or less ; raceme 1–2 ft , bracts ½–¾ in , flowers lemon-yellow , sepals 1–1¼ in long variable in breadth ; lip as long as the sepals , spur a broad sac , anther with a 2 fid top, and long anterior process, pollen obtusely angled —Wight describes the leaves as 2 ft long, lanceolate

23 **E. macrobulb**... 144, scape robust, racem... oblong acute, petals shor... lobes short subterminal, nerves thickened at the ... towards the apex

SIKKIM HIMALAYA (*Ic in Herb Calcutt*). TENASSERIM, at Moulmein, *Parish*

24 **E. macrorhizon,** *Hook f* , scape robust, raceme lax fld , bracts long slender, sepals lanceolate acuminate and shorter obovate petals many-nerved, lip broad obtusely 3 lobed many nerved, 3 median nerves tubercled, disk of mid- and side lobes rough, spur conical

... Calcutt)
... not seen *Scape* ... , about equalling ... the column but ... ves slender, con

tracted above the broad rounded base, then dilating into the rounded side lobes, margins of midlobe crisped and crenate

25 **E. sanguinea,** *Hook f*, flowers large, sepals ovate lanceolate acuminate, petals shorter elliptic apiculate many-nerved, lip short, side lobes rounded, midlobe orbicular or ovate, disk with many crenulate nerves Cyrtopera sanguinea, *Lindl in Journ Linn Soc* iii 32, *Bot Mag* t 6161

SIKKIM and BHOTAN HIMALAYA, alt 2–5000 ft, *J D H*, &c KHASIA HILLS, alt 5000 ft, *Mann*

sheaths loose *Raceme* 6–12 fld, 1½ in diam, disk red purplish, broad, obtuse, petals (always?) ither obscurely notched, pollinia ovoid —Leaves unknown

872, 276, raceme acuminate, petals ise, midlobe large e 3 median nerves k divaricating and much branched

TENASSERIM, at Moulmein *Parish* ANDAMAN ISLANDS, *Kurz*

Stem at the base tuberous, with thick roots *Leaves* short during flowering, linear lanceolate *Scape* 1–2 ft, sheaths short, bracts shorter than the pedicels, sepals ⅔ in long, lip shorter than the sepals, white with green edges and nerves; spur conic, obtuse, anther 2-tubercled —This much resembles *E virens*, but the leaves are much broader, and the column produced into a foot

SPECIES UNKNOWN TO ME

CYRTOPERA RUFA, *Thwaites Enum* 302, rootstock tuberous, leaves not seen, scape 2 ft reddish, sheaths 3 distant, bracts narrowly lanceolate equalling the ovary,

E ATRO-VIRENS, *Lindl Gen & Sp Orchid* 183 drawing made for Wallich in the Calc of India is a Mauritian species, E the Mauritius, p 360 (where it is *E maculata*)

EULOPHIA sp, *Trimen Cat Pl Ceyl* 89 (C P 3958) Not named or described

I fail to recognize the following *Eulophias* described in Griffith's Notulæ, vol iii p 162, and Ic Pl Asiat t. 285, f 2, p 263 and t 285, f 2, p 266 and t 285, f 3, p 350 and t 351 B, f 14

40 CYMBIDIUM, *Swartz*

Epiphytes, rarely terrestrial, stem very short, rarely elongate and pseudobulbous, roots tufted *Leaves* very long, narrow and coriaceous, rarely short *Scape* loosely sheathed, flowers often large in suberect or drooping racemes *Sepals* and subequal *petals* free erect or spreading *Lip* sessile at the base of the column and embracing it upwards, base

concave, side lobes erect, midlobe recurved, disk with usually 2 pubescent median ridges *Column* long, foot 0, anther 1 or imperfectly 2-celled, pollinia 2 deeply grooved or 4, subglobose or pyramidal, sessile on the broad strap or gland —Species about 30, tropical and subtropical, on the Mountains of Asia, with a few African and Australian

* Leaves rudimentary or 0 at flowering time

1 **C. macrorhizon,** *Lindl Gen & Sp Orchid* 162, terrestrial rootstock creeping branched, bracts narrow membranous

N W INDIA, *Royle Falconer* KHASIA HILLS, alt 5–6000 ft, *Lobb*, &c, NAGA HILLS (*Herb Calcutt*)

C–
su
1¼
wl
na
an

according to Clarke Lindley describes the rootstock as jointed and the ridges of the lip as arcuate

2 **C. sikkimense,** *Hook f*, epiphytic, bracts minute triangular ovate

SIKKIM HIMALAYA, Lachen Valley, alt 6000 ft *J D H*

Rootstock very stout *Scape* with many obt... basal sheaths ...
higher up 1 in long, raceme 4–
bracts ¼ in, pedicel with o
lateral lanceolate, acute, subfal

** Leaves elliptic lanceolate

3 **C. lancifolium,** *Hook Exot Fl* t 51, leaves long petioled plicate, scape shorter than the leaves few fld, bracts lanceolate shorter ... with two ... *d* 164, *in* ... Gibsoni, ... *um*, *Blume*

SUBTROPICAL HIMALAYA, from Nepal to Mishmi KHASIA HILLS, alt 4–6000 ft, *Griffith*, &c PERAK, alt 2–4000 ft, *Scortechini*, &c —DISTRIB Java, China, Japan

C. ...

TENASSERIM, on Moolee it, alt 6000 ft, *Parish* BURMA, on the Siam frontier, *Berkeley*

3–5 in, recurved, fld, sheaths few, rs 2–2½ in diam, narrowed at the base, white spotted with red, side lobes rounded erect, midlobe oblong, tip rounded apiculate, anther smooth, pollinia 3 angular, gland broadly triangularly obtuse above, sides acute

5 **C. Devonianum,** *Paxt Mag Bot* x 97, *cum ic*, leaves stoutly petioled thickly coriaceous, petiole articulate, scape with raceme as long as the leaves drooping very many fld, bracts very small, pedicels very short, disk of lip with two short ridges with swollen tips between the side lobes *Warner Orchid Alb* t 170, *Reichb f in Gard Chron* 1881, i 395

SIKKIM HIMALAYA, *Mann* KHASIA HILLS, *Gibson*, on Kollong rock, alt 5000 ft, *J D H & T T*

Stem very stout at the base obscurely pseudobulbous *Leaves* several, 6–12 in, narrowed into a petiole 3–5 in *Scape* very stout, 8–10 in, basal sheaths 1½ in,

brown with dull mauve streaks and blotches In a specimen from Assam the tip of the lip is white with purple spots

*** Leaves loriform, very long, tip broadly unequally 2 lobed

6 **C. aloifolium,** *Swartz in Nov Act Upsal* vi 73, *in Schrad Journ Bot* 1779 ii 218, flowers 1½–2 in broad, se broadly oblong or subor disk with 2 curved thick lamella *Roxb Fl Ind* iii 458, *Lindl Gen & Sp Orchid* 165, *Wall Cat* 7352 C, *Walp Ann* vi 624 (*excl Ic Wight*) C pendulum, *Swartz*, & *Lindl ll c*, *Walp l c* (*excl cit Bot Reg*), *Roxb Cor Pl* i 35, t 44, *Fl Ind* iii 458 C crassifolium, *Wall Cat* 7357 C Mannii, *Reichb f in Flora* 1872 274 Epidendrum aloifolium, *Linn Sp Pl* 953 Ærides Borassi, *Smith in Rees Cyclop Suppl* —*Rheede Hort Mal* xii t 8

TROPICAL HIMALAYA, from East Nepal TENASSERIM and the ANDAMAN ISLANDS

Stem short, stout *Leaves* 1–3 ft by

Flowers larger, sepals and petal sub

acute bordered with white, lip yellowish streaked with red—all as described by Thwaites —3 Swartz's *C pendulum* which he says is too near *C aloifolium*, flowers small or large sepals and petals pale dirty yellow or greenish with a more or less broad dirty purple centre lip streaked with red To this belongs Wallich's

includes this *bicolor* and *sikkimense* Reichenbach's description of *C Mannii* is that of *aloifolium* of which there are specimens in Mann's Herb (kindly lent to me), as to his habitat of "Obres," Mr Mann informs me he knows of no such place

7 **C. bicolor,** *Lindl Gen & Sp* 164, characters of *C aloifolium*, but epichile longer than the hypochile ovate oblong narrowed towards the tip C aloifolium, *Wight Ic* t 1687 8, *Dalz & Gibs Bomb Fl* 266, *Thwaites Enum* 308 C erectum, *Wight Ic* t 1753 Epidendrum aloifolium, *Bot Mag* t 387

is, I have l
as acute
and true bicolor

8 **C. Finlaysonianum,** [illegible] *Cat* 7358, *Gen & Sp*
[illegible] ts of *C aloifolium* but
contracted at the base,
d C Wallichii, *Lindl*
Gen & Sp 165 C aloifolium, *Wall Cat* 7352 A, B C pendulum, *Bot Reg* 1840, t 25 (*excl syn*) C pendulum, *var* brevilabris, *Lindl in Bot Reg* xxx t 24 C tricolor, *Miq Choix*, t 19

PENANG, *Porter, Curtis* Singapore, *Hort Loddiges*

Leaves 1–2 ft by $\frac{2}{3}$–$1\frac{1}{3}$ in *Raceme* 2 3 ft, slender, basal sheaths short, inflated, flowers 1–2 in apart, sepals and petals subequal linear lanceolate acute or obtuse, dull yellow, lip not saccate, side lobes acute, streaked with red, midlobe white, red purple towards the tip

9 **C. pubescens,** *Lindl in Bot Reg* 1840 *Misc* 75, 1841, t 38,

the margin of the midlobe

**** Leaves linear or elongate linear lanceolate acute or acuminate

† *Bracts very small*

10 **C. eburneum,** *Lindl in Bot Reg* 1847, t 67, *in Journ Linn*

Soc III 28, scape suberect 2-3 fld sheathed to the top, flowers 4-5 in diam white, hypochile of lip with a very thick 3-5 grooved pubescent golden ridge *Bot Mag* t 5126, *Paxt Mag Bot* xv t 145, *Warner Sel Orchid* t 21, *Jenning*
1882, 297, *Wien Ill G*
f 78, 1884, II 77, f 17

EASTERN HIMALAYA, Nepal (*Ic in Herb Kew*) Sikkim, alt 1000 ft, *Clarke* KHASIA MTS, alt 5000 ft, *Griffith* &c

Leaves 12-24 by ¾-⅞ in, acute or acutely 2 fid *Scape* 8-12 in, sheaths equitant, erect, lanceolate finely acuminate, bracts acuminate, pedicel with ovary 1½-2 in, flowers very odorous, sepals very variable in breadth, petals subfalcate, side lobes of lip narrow, obtuse, midlobe small, short, undulately crenate, dark yellow

Var *Parishii*, leaves broader, lip blotched with dark purple or crimson C

Var *Williamsiana*, Reichb f in Gard Chron 1881, I 530, has the midlobe and sides of the lip light purple and column light rose cold

Var *Dayana*, leaves 4 ft by ½ in corky beneath, flowers yellow white with purple streaks C Dayanum, *Reichb f in Gard Chron.* 1869 710 —Assam (*Hort Day*) —I have not seen this

11 **C. grandiflorum,** *Griff Notul* III 342, *Ic Plant Asiat* t 321, leaves 8-24 by ⅔-1 in, scape
6-12 fld, flowers 3-4 in diam,
green, lip yellowish pubescent
waved and crenate blotched
Reichb f in Gard Chron 1866 7, *Batem in Bot Mag* t 5574 C giganteum, in part, *Lindl in Journ Linn Soc* III 29 —Cymbidium sp, *Griff Itin Notes* 145, No 698

EASTERN HIMALAYA, East Nepal, Sikkim and Bhotan, alt 5-7500 ft, *Griffith*, &c

Scape 12-18 in, lower sheaths drooping, bracts very small, lateral recurved, lip with 2

12 **C. giganteum,** *Wall Cat* 7355, leaves 1-2 ft by ⅔-1½ in

TROPICAL HIMALAYA, from Kumaon, ascending to 4000 ft eastwards to Bhotan and the KHASIA MTS, alt to 4-5000 ft

Habit of C *grandiflorum* and leaves nearly as broad, but flowers smaller and differently coloured —Blume founds the genus *Iridiorchis* on the protuberant base of the column forming a small sac, a character not shown in his analysis and which I do not find in drawings on dried specimens There are drawings of several varieties of

this in Herb Kew and Calcutta, varying much in the depth of colouring of the flowers The veins of the lip are very strong, arched and purple on the broad hypochile, which has 2 central hairy ridges, villous and diverging, and again meeting

those of *C longifolium* The racemes attain 5 ft in length, the very numerous flowers vary in colour, and the lip in breadth

13 **C. longifolium,** *Don Prodr* 36, leaves 2-3 ft by $\frac{1}{3}$-$\frac{2}{3}$ in narrowly linear finely acuminate scape suberect or decurved many fld, flowers

11 C erythræum *Lindl l c* 30 Limodorum angustifolium, *Herb Ham (ex Lindl Gen & Sp)*

SUBTROPICAL HIMALAYA, alt 5-6000 ft, from Kumaon, *Blinkworth*, eastwards KHASIA MTS, common

Resembles *C giganteum*, but the leaves are very narrow, flowers smaller, and their colouring different The lip is similar in shape, in the strong purple nerves, and pubescent ridges Lindley's *C erythræum* is founded on a drawing of mine of the flowers and fruit of a plant gathered in Sikkim, but of which I preserved no specimens, it has a small golden midlobe of the very narrow lip, but it otherwise does not seem to differ from *longifolium*, to which the specimens of *erythræum* in Lindley's Herbarium certainly belong

†† *Bracts large, lanceolate or cymbiform*

14 **C. cyperifolium,** *Wall Cat* 7353, leaves 2-3 ft by $\frac{1}{4}$-$\frac{1}{3}$ in, scape erect few fld, bracts very slender equalling or exceeding the ovary, sepals and petals linear-lanceolate acute pale green and yellow streaked

ted with red *Lindl*
C hæmatodes, *Lindl*
Notes 126, No 451
Ind 92 Limodorum

Cyperorchis, differing in
is *C hæmatodes* (which is
ror as affects other plants

15. **C. ensifolium,** *Swartz in Nov Act Upsal* vi 77, leaves 2-3 ft, b $\frac{1}{4}$-$1^{\frac{1}{3}}$ in sessile or petioled ensiformly lanceolate, bracts shorter than the

ovary, sepals and petals lanceolate acute green streaked with red, lip glabrous whit
112, *Lindl*
Bot Mag t 1
Epidendrum
? *Bot Repos*
t 3.

SIKKIM HIMALAYA, in the Terai KHASIA HILLS, alt 2-4000 ft, *J D H & T T*, &c CEYLON, in the Central Province, *Thwaites* —DISTRIB China, Japan

Sikkim specimen has sessile leaves, many flowers, and a white lip with pale brown bars along the margin of the midlobe (much as in the Bot Reg figure) and no spots I doubt *C sinense* differing from *ensifolium* Lindley would combine them

DOUBTFUL AND EXCLUDED SPECIES

Australian species

C IRIDIOIDES, *Don Prodr* 36, from Nepal, *Wallich*, doubtfully referred by Lindley to *C giganteum* is probably a *Cœlogyne*

CYMBID sp, *Griff Notul* iii 343, *Ic Plant Asiat* t 319, is *Tainia latifolia* The reference is omitted at vol v. p 820

41 CYPERORCHIS, *Blume*

eburneum

1 **C. elegans,** *Blume Rumph* iv t 47, *Orchid Archip Ind* 93,

SUBTROPICAL HIMALAYA, alt 4-7000 ft, from Nepal to Bhotan KHASIA MTS and MUNNIPORE, alt 4-6000 ft

Leaves 1½-2 ft by ½-1 in *Scape* 6-18 in, curved, densely clothed with imbricating compressed lanceolate acuminate sheaths 2-5 in long, raceme pendulous,

In Griffith s Herb this is name
ment of labels (see *C eburneum*,
forms apparently of this —1
flushed with pale pink, lip nc
sheaths distant, 2 in long, and raceme inclined, flowers few, secund drooping
pale yellow green, lip yellow, no ridges shown; 3 a smaller plant leaves 9 in
scape 7 in, densely clothed with imbricating sheaths 3 in long, raceme suberect,
secund, 5 fld, flowers yellowish, 1¾ in long this last is named *Cymbid elegans*,
var *lutescens*

C.

Lindl l c 28

ASSAM *Mann* KHASIA MTS alt 4–5000 ft, *Griffith*, &c

Habit and foliage of *C elegans*, but raceme very short decurved at the top
flowers larger, always
broader, without the
broader, capsule ver

ts of a flowering and fruiting speci-
column of a *Cœlogyne* from which
uthor, referring to Griffith s descrip
densiflorum from Myrung, and of
hasia Mts) observes ' It is impos-
or Griffith by his editor, without
e" To this confusion Lindley has
from the Churra to the Surureem
ly recognizable by the description is
C densiflorum, which is certainly *Cyperorchis elegans* (I have gathered it at
Myrung) *C affine* and the unnamed one, having white flowers, are both probably
C Mastersii a name which Griffith's *affine* would have superseded, had he really
given it, but on referring to his mss preserved at Kew, I find no such name
Griffith s descript on being headed ' Cœlog affine,' meaning s mply that it is a
plant allied to *Cœlogyne*, and the Churra plant is so ticketed by himself in

3 **C. cochleare,** *Benth in Journ Linn Soc* xviii 318, raceme

SIKKIM HIMALAYA, alt 4–6000 ft, *J D H*, &c KHASIA HILLS, alt 5–6000 ft,
Clarke; at Myrung *Griffith* Tezpore in ASSAM, *Mann*

Leaves 2–3 ft by ½–¼ in *Scape* 12–18 in, very slender, sheaths 3–4 in, lax,
sepals and revolute petals brownish green, lip yellow speckled with red, m dlobe
suborbicular, golden yellow

41/1 CREMASTRA, *Lindl*

A terrestrial herb, rootstock tuberous *Leaves* radical, elliptic plicate *Scape* solitary stout sheathed *Flowers* in secund racemes pendulous *Sepals* and *petals* very long narrow connivent in a tube below, lanceolate acuminate and spreading and recurved above *Lip* adnate to the base of the column erect, linear base subsaccate, tip dilated 3 lobed, lobes linear, disk with a tongue shaped appendage *Column very long, slender straight* top dilated 3 lobed, anther shortly stipitate, 1 celled, pollinia 4, ovoid compressed, caudicle and gland membranous

C. Wallichiana, *Lindl Gen & Sp Orchid* 172 *Franch & Savat Enum Pl Jap* ii 21 Hyacinthorchis variabilis *Blume Cent Plant Nov* 1829, 4, *Mus Bot* 48 fig 16, *Walp Ann.* iii 628

TEMPERATE HIMALAYA Nepal, *Wallich* Sikkim, alt 5 7000 ft, *J D H*, &c —DISTRIB Japan

Tuber the size of a chestnut *Leaves* 6–10 by 2 2½ in, subsessile or petioled *Scape* with raceme 1–2 ft sheaths long loose, flowers 1½ in long, narrow, purple, pedicels short, bracts linear —I find no evidence of Blume's Centuria' ever having been published or even printed, if it was so, his name has priority

42 GEODORUM, *Jackson*

Terrestrial herbs rootstock tuberous hypogeal *Leaves* elliptic acute, plicate *Scape* from the rootstock stout erect, sheathed shorter than the leaves, flowers crowded in decurved racemes bracts narrow membranous [illegible] n the base [illegible] involute [illegible] ked b sal callus *Column* short, stout, anthers 2 cells appendaged after dehiscence by the persistent detached faces of the cells, pollinia 2 broad foveolate sessile or subsessile on a broad strap or gland —Species 6–8? Indian, Malayan and Australian

[illegible]

1 G. [illegible] *Hook* [illegible]

[illegible] *Gen & Sp Orchid* [illegible] *ll Cat* 7376 Limodorum [illegible] (*descr and fig in both* [illegible])

TROPICAL HIMALAYA *from Nepal eastwards*; BENGAL ASSAM BURMA, &c [illegible]

of the axis of the scape after flowering, and that the appearance of an acute lip is due to the infolding of its margins towards the apex, then the *G purpureum* is the commonest and widest-distributed Indian species Dalzell and Gibson alone identify a plant with *G purpureum*, Br, and I have examined authentic specimens of it, which they did not, for they give Brown's characters for the species, whilst those of their specimens are what I have given above *G purpureum* is the tallest and largest leaved Indian species, its flowers vary from white veined with red purple to pale purple with stronger veins

2 **G. dilatatum,** *Br in Hort Kew Ed* 2, v 207, leaves usually sessile, sepals linear-oblong subacute 3–5 nerved, petals obovate-oblong 5–7 nerved lip broadly cymbiform, tip dilated recurved crenulate or undulate, disk smooth or with granulate nerves ending in irregular small tubercles *Lindl Gen & Sp Orchid* 175, *Lodd Bot Cab* t 1797, ? *Wight Ic* t 912 Limodorum recurvum, *Roxb Cor Pl* i, 33 t 39, *Fl Ind* iii 469 Malaxis cernua, *Willd Sp Pl* iv 93 Otandra cernua, *Salisb in Trans Hort Soc* i 261

ASSAM, SILHET, BURMA, the DECCAN PENINSULA and CEYLON (*all more or less doubtful*)

If I am right in respect of this species, it differs from *purpureum* in its lower stature, broader petals and lip, the disk of which is smooth, granulate or subcaruncled Wight's figure is probably an exaggeration of the flowers Dalzell and Gibson describe it as a Concan plant, but I have seen no specimens so named by them

3 **G. [illegible]** [illegible] ascending or erect, sepals [illegible] lip very broad narrowed [illegible] arly naked, tip crenulate [illegible] Griff in Calc Journ Nat Hist v, 358, t. 24

BURMA, *Griffith*, Tenasserim, at Moulmein, *Wallich*

Griffith further describes his *G attenuatum* (which is certainly the same as Wallich's [illegible]

4 **G. citrinum,** *Jackson in Andrews' Bot Rep* t 626, flowers $1\frac{1}{2}$ in diam yellow, sepals and petals very broad acute, lip large oblong deeply [illegible] more or less streaked with red or [illegible] l or emarginate *Lindl* [illegible] *Bot Reg* t 2195, *Wall. Cat.* [illegible]

CHITTAGONG, *Wallich* MOULMEIN, *Wallich*, *Parish* PENANG (*Ic in Herb Kew*)

DOUBTFUL SPECIES

G PALLIDUM, *Wall in Don Prodr* 31 There is no specimen of this in

are described as rather small

tinged with yellow and purplish base

G RARIFLORUM, *Lindl Fol Orchid* 3, from Assam, is, I think, certainly *G purpureum*

different plant

43 GRAMMATOPHYLLUM, *Blume*

Large stout epiphytes *Leaves* linear, distichous jointed on their sheaths *Scapes* lateral, long, stout, flowers large, racemose *Sepals* and *petals* subequal, spreading *Lip* small, adnate to the base of the column (mobile?) erect, concave, its side lobes embracing the column, midlobe short recurved *Column* semiterete, foot 0, top incurved, anther broad, 2 celled, pollinia 2, subglobose 2-cleft, attached one to each horn of a curved strap or gland —Species 3 or 4, Malayan

G. speciosum, *Blume Bijdr* 377, fig 20, *Rumph* iv 47, t 191,

TENASSERIM, *Parish* PERAK, *Scortechini* MALACCA *Griffith* (*Kew Distrib*

... ovate, hirsute, disk with depressed

straight nerves and two linear ridges between the side lobes —I cannot find characters whereby to distinguish *G fastuosum* & *macranthum*, the latter was founded on Griffith's specimens The flowers vary much in size, and the sepals and petals of the Perak plant are narrower than in the others

44 DIPODIUM, *Brown*

the side lobes reduced to small teeth, pollinia separately stipitate on a globose gland —Species 6, Australian, Malayan and Pacific

1 **D. pictum,** *Reichb f Xen Orchid* ii 15, and 20, t 107, stem elongate scandent epiphytic from a terrestrial root leaves spreading and recurved linear *Walp Ann* iii 562 vi 647 Wailesia picta, *Lindl in Journ Hort Soc* iv (1849) 262, *in Paxt Mag Bot* xvi 321 *with fig* Grammatophyllum scandens *Griff Notul* iii 345 *Ic Pl Asiat* t 324 Leopardanthus scandens *Blume Rumph* iv 47 *Mus Bot* i 47, t 15

MALACCA, *Griffith, Maingay* —DISTRIB Java

streaked with crimson, disk and lip villous

2 **D. paludosum,** *Reichb f Xen Orchid* ii 15, stem and scape strict erect, leaves strict ensiform erect *Walp Ann* vi 648 Grammatophyllum paludosum, *Griff Notul* iii 344 G affine *Griff Ic Pl Asiat* t 323 Wailesia paludosa *Reichb f in Bonpland* 1854 93

MALACCA in swamps, *Griffith* (*Kew Distrib* 5317), *Maingay* (*K D* ...) PERAK, *Wray*

Stem 1-2 ft *Peduncle* as long, bracts small, ovate, acute, pedicels ... flowers 1½ in diam, sweet scented white blotched with purple sepals ... reflexed, lip lanceolate, acute, with a villous ridge from the base to the ... tip, side lobes reduced to small teeth

45 THECOSTELE, *Reichb f*

Epiphytes, pseudobulbous *Leaf* 1, shortly petioled *Scape* ... slender, flowers racemed *Sepals* subequal, broad *Petals* ... column, 3 lobed, base ... in front, side lobes ... *Column* slender, ... pollinia 2, subglobose ...

1 **T. Zollingeri,** *Reichb f in Bonpland* v 37, *Xen* ... 133, t 147, side lobes of lip subclavate sigmoid, midlobe ... date T alata *Par & Reichb f in Trans Linn Soc* xxx 135 ... alatum, *Roxb Fl Ind* iii 459

CHITTAGONG, *Roxburgh* TENASSERIM, *Parish* —DISTRIB ...

2 **T. Maingayi,** *Hook f Ic Plant ined* , side lobes of lip fan shaped, midlobe broadly ovate reflexed

MALACCA *Maingay*

Pseudobulbs oblong ⅔–1 in *Leaf* 3–5 in , from obovate- to linear-oblong *Scape* with 6 8 fld raceme 4 in , flowers 1 in diam , sepals acuminate —Only one specimen seen

3 **T. quinquefida,** *Hook f Ic Plant ined* , side lobes of lip linear, midlobe deeply 3 lobulate, side lobules hatchet shaped, mid lobule ovate acute

MALACCA *Maingay*

Pseudobulbs 1 in , oblong *Leaf* 5–7 in linear-oblong, tip obtuse very oblique *Scape* with raceme 3 in , flowers 1 in diam , sepals acute, lateral very broad, lip 5 fid from the deep lobing of the midlobe

46 BROMHEADIA, *Lindl*

Terrestrial erect rigid leafy herbs pseudobulb 0 *Leaves* distant ... cemes or panicles , bracts subequal, narrow, widely ... bracing the column erect, ... *umn* membranous, broadly ... pollinia 2, ovoid, sulcate,

1 **B. palustris,** *Lindl in Bot Reg* 1841, *Misc* 89, 1844, t 18, tall leaves 3–5 in , racemes many fld *Bot Mag* t 4001, *Wight Ic* t 1740, *Walp Ann* vi 630 B Finlaysoniana, *Reichb f in Walp l c* 882 Grammatophyllum ? Finlaysonianum, *Lindl in Wall Cat* 7561, *Gen & Sp Orchid* 173

PENANG PERAK MALACCA and SINGAPORE (in dry exposed places, *Ridley*) — DISTRIB Sumatra, Philippines

Stem 4–8 ft , terete, very stout *Leaves* 3–5 by ⅓–½ in , tip 2-lobed many-

[illegible]

? 2 **B. aporoides,** *Reichb f Ot Bot Hamb* 44 , dwarf, leaves 1½–2 in , peduncle very short 1–2 fld

TENASSERIM , at Moulmein *Parish*

[illegible]

47 POLYSTACHYA, *Hook*

Pseudobulbous leafy epiphytes *Leaves* few, distichous, narrow, coriaceous jointed on their sheath *Scape* terminal sheathed , flowers very small, in narrow panicles *Sepals* free, dorsal ovate, lateral triangular adnate to the foot of the column *Petals* very narrow *Lip* superior, clawed, jointed on the foot of the column erect, 3 lobed, side lobes small

erect, midlobe spreading or recurved *Column* short, broad, anther 1- or sub-2 celled, pollinia 4, ovoid, cohering or connate in pairs, attached to a very short strap, or gland?—Species about 10, all tropical, chiefly American

1 **P. Wightii,** *Reichb f in Walp Ann* vi 640, stem 4–6 in, flowers yellow, lip broader than long, side lobes nearly as long as the short broad rounded midlobe disk with the median ridge densely furfuraceous P luteola, *Wight Ic* t 1678

MALABAR, on the Iyamallay Hills, *Wight* (*Kew Distrib* 2090) ? PENANG, *Curtis* CEYLON

Leaves 2–3, 4–6 by ½–1 in *Stem* stout, panicle glabrous branches short, sheaths long, coriaceous, flattened, bracts small acute, persistent, flowers yellow, sepals ¼ in long, acute *Capsule* ½ in long —*P luteola*, Hook Exot Flor t 105, figured from a cultivated specimen said to have been sent by Wallich has been pronounced by Lindley (Bot Reg 1838, Misc 78 to be a West Indian plant

2 **P. purpurea,** *Wight Ic* t 1679, flowers purplish lip longer than broad, side lobes much shorter than the large rounded midlobe, disk with a short median ridge furfuraceous *Walp Ann* vi 640

TRAVANCORE, on the Iyamallay Hills, *Wight* (*Kew Distrib* 2091)

Very near if not a variety of *P Wightii*, but the flowers are smaller, and if my analysis is correct (the materials are unsatisfactory) the lip is much narrower

3 **P. zeylanica,** *Lindl in Bot Reg* 1838, *Misc* 78 (*excl Syn*), stem 12–18 in, lip cuneate-obovate, side lobes small acute, midlobe rounded, disk furfuraceous, capsule ½ in reticulate between the ribs *Walp Ann* vi. 639

CEYLON *Walker, Gardner*

A very much larger plant than either of the former, with a stout stem, and panicle 6–10 in long with branches 1–3 in long, flowers larger, and leaves larger and broader upwards The Mauritian *P mauritiana* Spreng Syst Veg iii 742 (Dendrobium polystachys, *Thou Orchid Afric* t 85), which Lindley referred to this more resembles *P Wightii*

48 PLOCOGLOTTIS, *Blume*

1 **P. acuminata,** *Blume Mus Bot* i 46, leaf solitary, bracts lanceolate as long as the pedicel or longer, raceme puberulous *Miquel Fl. Ind Bat* iii 676

2 **P. javanica,** *Blume Bijdr* 380, t 21, *Orchid Archip Ind.* t 14; *Mus Bot* i 46, leaf solitary, bracts short ovate, raceme glabrous *Lindl Gen & Sp Orchid* 132

PERAK, alt 3–1200 ft, *Scortechini King's Collector* —DISTRIB Java

Leaf blade 10–12 by 3–4 in, as long as the very slender petiole *Scape* much

is flowerless

49 LUISIA, *Gaud*

Tufted epiphytes, stem terete, rigid sheathed, pseudobulbs 0 *Leaves* elongate terete obtuse *Flowers* drooping, small, spicate on a short or very stout erect axillary rachis, bracts very short, thick, imbricating, persistent *Sepals* subequal or the decurved dorsal smaller *Petals* often

about 10, tropical Asia to N Caledonia

The materials at my disposal for the elucidation of this remarkable genus are, though considerable far from being sufficient Above all careful drawings for living plants should be obtained, when the following attempt at diagnosing the Indian species will want revision and probably correction

* *Petals not much longer than the lateral sepals (most so in* L primulina)

1 **L. teretifolia,** *Gaud Bot Freyc Voy* 427, t 37 leaves 4–6 in, flowers small lateral sepals subacute keel winged, petals linear oblong obtuse hardly longer than the sepals hypochile subquadrate saccate epichile broadly cordate *Blume Rumph* i t 191 f 3 t 197 D, *Mus Bot* i 63 *Lindl Fol Orchid* 2 (*excl in all Syn Ep triste*) L burmanica, *f in Trans* *nn* vi 622 461 (*not of* *ff Notul* iii *not text*) (*Ic Jerdon*) *Griffith*, &c c —DISTRIB

Leaves variable in thickness *Rachis of spike* ½–¾ in *Petals* ½–¼ in long *Lip* equalling or rather exceeding the sepals *Column* very short *Capsule* ¾–1½ in —Blume erred in referring

consequently *teretifolia* Lindley's *L trichorhiza* consists of three Nilghiri specimens of *L teretifolia* (mislabelled Khasia Mts) and one fruiting Khasian specimen (as indicated by Reichenbach in Herb Lindl) For *Cymbid triste*, Willd , see *L tristis*

2 **L. brachystachys,** *Blume Rumph* iv 50, *Mus Bot* i 64, leaves 2–6 in slender, sepals and petals as in *L teretifolia*, lip obovate oblong nearly flat grooved hardly constricted at the base of the broadly ovate epichile *Reichb f Xen Orchid* i 204, t 78, f 1 *Lindl Fol Orchid* — Mesoclastes brachystachys, *Lindl in Wall Cat* 1994, *Gen & Sp Orchid* 45

TROPICAL WESTERN HIMALAYA; Garwhal, *Falconer*, Kumaon, *Stewart* SILHET and the KHASIA HILLS, *Wallich* BENGAL, at Jessore and Dacca, *Clarke* TENASSERIM (*Ic Parish*)

A more slender plant than *L teretifolia*, but perhaps a variety; flowers of the ... in the ... usually ... when ... *apsule* ½–1 in —Clarke describes the sepals green without rose purple within, petals rose-purple with green tip and base, lip yellow at base, black purple for ⅔ of upper part, but variable

TROPICAL HIMALAYA *Wallich*, Garwhal, *Falconer*

I have seen only two native specimens of this plant, a flowering and a fruiting from Garwhal they bear the mss name of *L retusa* Reichb f It is the ... re of ... eing ... *rhiza* ... spike ... the flowers are on slender pedicels, with the lip grooved as in *brachystachys*, but with the sepals and petals narrower and more acute Of the hairy roots of *L trichorhiza* described in Fl Exot I know nothing but Lindley, who no doubt saw the original plant, says that it has sometimes an enormous development of downy roots

4 **L. filiformis,** *Hook f*, stem elongate slender, leaves 6–12 in, ...

... *ves* as thick as a crow ... the short petals thus

... s 2 in slender, ... ral sepals ovate ... e of lip oblong ... lozenge shaped

ASSAM, *Griffith* (*in Herb Wight*) KHASIA HILLS, alt 3–4000 ft, *Mann*

6 **L. primulina,** *Par & Reichb f in Trans Linn Soc* xxx 144, t 30, f 1, stem short very stout, leaves 3–4 in very stout, rachis short few-fld, sepals subequal oblong acute petals larger obovate spathulate obtuse, lip much longer than the lateral sepals yellow hypochile small short saddle shaped, epichile large triangular ovate obtuse, margin obscurely lobulate

TENASSERIM, at Moulmein, *Parish*

7 **L. macrotis,** *Reichb f in Gard Chron* 1869, 1110, habit and leaves of *L Psyche*, sepals triangular keeled petals longer triangular epals violet black

Kew), in wh ch the ong), linear oblong, ame size, but dark

** *Petals much longer than the sepals*

8 **L. Psyche,** *Reichb f in Bot Zeit* 1863 98, *in Gard Chron* 1865, 342, stem tall stout, leaves 3–5 in stout, rachis short, flowers few large, petals linear spathulate or obovate obtuse twice as long as the obtuse concave sepals lip broadly ovate oblong retuse, base contracted saccate 2 auricled. *Bot Mag* t 5558

TENASSERIM, at Moulmein, *Parish* ? KHASIA HILLS, alt 3000 ft, *Mann*

Stem 1 ft, internodes 1 in *Leaves* str ct, ¼ in diam *Sepals* ½ in long, petals 1¼ in, variable in breadth, both pale greenish yellow *Lip* convex, nearly 1 in long, violet brown, tessellated with white or yellow, auricles erect, embracing the white column *Capsule* 1½–2 in long —Mann s specimen is in fruit only It has a large clavate capsule as figured by Parish in his drawing of *L Psyche*

9 **L. tenuifolia,** *Blume Rumph* iv 50, *Mus Bot* i 63, stem long slender, leaves 4–7 in, rachis ¼ in flowers few large, petals narrow twice as long as the ovate subacute concave sepals lip narrowly pandurform convex base broad 2 auricled, lip with 2 divergent lobes *Lindl Fol Orchid* 2, *Thwaites Enum* 302, *Dalz & Gibs Bomb Fl* 266, *Walp Ann*

i 63 L zeylanica, ich in Ann Sc Nat Gen & Sp Orchid d)

On the WESTERN GHATS, from the Concan to Travancore, *Wight, Dalzell, &c* CEYLON, in the Central Province *Macrae, Thwaites*

Leaves very variable in th ckness sometimes very long an l slender *Sepals* ⅓–½ in long, yellowish green stained or streaked with red; petals more green,

lip twice as long as the lateral sepals, white or greenish with deep purple base and lobes, or purple and streaked with paler lines (Dalzell), disk with 3 large calli Macrae's Ceylon specimen is like the Malabar plant A Richards' figure of *Birchea teretifolia* is a very bad one Rheede's figure in xii t 5, on which Linnæus' *Epidendrum tenuifolium* (*Cymbidium*, Willd) was founded, is not a *Luisia*, the leaves are grooved, and spike very different

10 **L. volucris,** *Lindl*, *Fol Orchid* 1, stem stout, leaves 3–5 in

SIKKIM HIMALAYA, *J D H* KHASIA MTS and SILHET *Lobb*, *J D H & T T* ? Chittagong H lls, *Ic in Hort Calcutt*

Stem 6–10 in, internodes ½ in *Rachis of spike* ½ in very stout *Petals* and *sepals* very pale yellow-green, lip dark purple, epichile hardly cordate (as described by Lindley) *Capsules* 1 in —Flowerless specimens closely resemble *L teretifolia* In the drawing of the Chittagong plant the stem is slender, the internodes are 1½ in and leaves 7–9 in, the petals not dilated at the tip, and the epichile of the lip green and grooved

11 **L. antennifera,** *Blume Rumph* iv 50, *Mus Lugd Bat* i 64, stem stout, elongate, leaves 3–4 in, rachis of spike very stout ¾–1½ in, petals linear ⅝ in long twice as long as the cymbiform sepals lip cuneately oblong, epichile hardly distinct from hypochile which has a broadly 2-auricled base *Reichb f Xen Orchid* i 265, t 78, f 2

PERAK, *Scortechini*, *King s Collector* —DISTRIB Borneo (*Low*)

12 **L. tristis,** *Hook f*, stem stout elongate, leaves stout 3–5 in, rachis of spike very stout 1–2 in, petals ⅔ in long linear twice or thrice as long as the sepals hypochile of lip quadrate base 2 auricled, epichile short broadly ovate-cordate grooved Cymbidium triste, *Willd Sp Pl* iv 99 Epidendrum triste, *Forst Prodr* No 314

13 **L. Grovesii,** *Hook f*, stem very slender elongate, leaves 6–10 in filiform, rachis of spike very short few fld, flowers 1 in diam, lateral sepals cymbiform, petals twice or thrice as long narrowly linear obtuse, hypochile of lip subquadrate flat, epichile broadly cordate, column very short broad

EASTERN BENGAL, in the Looshai Hills, *G B Groves* (*in Herb Calcutt*)

Closely resembles *L filiformis*, but at once distinguished by the long petals — ... of a speci- ... are pale ... sh in one

DOUBTFUL SPECIES

L MICROPTERA, *Reichb f. in Gard Chron* (1870) 1503, leaves terete rather stout, raceme few fld, flowers small, sepals ligulate acute, longer than the petals, both straw-cold, lip half purplish half yellow, hypochile ovate uncinate at the base

CYMBIDIUM TENUIFOLIUM, *Willd of Thwaites mss* (C P 3530) is certainly not *L tenuifolia*, Bl, having short petals and a broad lip It is probably a new species near *filiformis*, but the specimen being solitary and only 1 fld I leave it undescribed

50 COTTONIA, *Wight*

C. macrostachya, *Wight Ic* t 1755, *Dalz & Gibs Bomb Fl* 263, *Lindl in Journ Linn Soc* iii 39, *Bot Mag* t 7099 C peduncularis, *Reichb f in Cat Orchid Schiller* 1857 52, *Thwaites Enum* 303, *Walp Ann* vi 860 Vanda peduncularis, *Lindl Gen & Sp Orchid* 216, *Paxt Fl Gard* iii t 253

The DECCAN PENINSULA, on the Ghats from the Concan southwards CEYLON, in the Central Province

50/1 DIPLOPRORA, *Hook f.*

Stem short, slender *Leaves* falcately lanceolate acuminate *Scape* obovate mn cym mpressed 2 celled, *Capsule* slender

D. Championi, Cottonia Championi, *Lindl Linn Soc* iii 39, *Benth Fl* im 302 Vanda bicaudata

BHOTAN HIMALAYA, *Gammie* KHASIA MTS alt 3-4000 ft, *J D H & T T* TENASSERIM, *Parish* CEYLON, *Thwaites* —DISTRIB Hong Kong

51. STAUROPSIS, *Reichb f*

Epiphytes, stem stout, leafy. *Leaves* distichous, coriaceous, flat 2 lobed *Flowers* in lateral racemes *Sepals* and similar but smaller *petals* widely spreading *Lip* sessile, adnate to the base or sides of the column, incurved, base simple or saccate, lobes narrow, disk naked or hairy *Column* short, thick, foot 0, top truncate, anther 1 celled pollinia 2, sub globose, 2 cleft, strap broad, gland large —Species about 8, Malayan

1 **S. giganteus,** *Benth in Gen Plant* iii 572, flowers very large golden yellow ocellately blotched with cinnamon, sepals and petals spathu lately obovate, lip white hatchet shaped obtuse, base cordate side lobes rounded, midlobe narrow obtuse fleshy disk with a broad conical callus Fieldia gigantea, *Reichb f Xen Orchid* ii 39 *Walp Ann* vi 871 Vanda gigantea, *Lindl in Wall Cat* 7326 *Gen & Sp Orchid* 215, *Fol Orchid* 2, *Bot Mag* t 5189 *Reichb f l c* 38, t 112, *Ill Hortic* 1861, 277, *Rev Hortic* 1874, t 291 V Lindleyana, *Griff Notul* iii 353

TENASSERIM, at Moulmein *Wallich, Griffith*

Stem pendulous *Leaves* 1–2 ft by 2–3 in, very thick, flat *Raceme* 10–15 in, decurved many-fld, rachis very stout, bracts short, broad, flowers 3 in diam, lateral sepals horned behind below the tip —Griffith describes two sterile stamens between the lateral sepals and petals

2 **S. undulatus,** *Benth mss*, flowers 1½ in diam nearly white, sepals and petals spathulately oblanceolate waved base of lip saccate adnate to the sides of the column midlobe laterally compressed 3 ridged Vanda undulata *Lindl in Journ Linn Soc* iii 42, *Reichb f in Gard Chron* 1875, ii 212, 1878, i 168

EASTERN SUBTROPICAL HIMALAYA, Sikkim and Bhotan ascending to 6000 ft The KHASIA HILLS, alt 5–6000 ft

Stem 6–10 in, sheaths and scape minutely warted *Leaves* 3–4 by ½–¾ in, unequally obtusely 2-lobed *Scape* 5–8 in and raceme strict erect, laxly few fld near the top, bracts ¼ in long, broad, obtuse flowers white flushed with pink or ... r, ... lip ... us in the base of the lip being adnate to the sides of the column, and forming with it a cup with a thickened rim

52 ARACHNANTHE, *Blume*

Characters of *Stauropsis* but lip jointed on to the base of the column and mobile —Species 5 or 6, Himalayan and Malayan

This character of the mobile lip requires confirmation in the living plant of some species

* *Flowers in simple racemes Side lobes of lip much smaller than the midlobe*

1 **A. Cathcartii,** *Benth in Gen Plant* ...
lateral
rounded
Ann vi
t 5845,
Warner
t 66, *Gard Chron* 1870, 1409

EAST NEPAL and SIKKIM HIMALAYA, alt 3–6000 ft, *Griffith's Collectors, J D H*, &c BHOTAN (*Ic in Hort Calcutt*)

Stem 12–18 in, stout *Leaves* 6–9 by 1–1½ in, flaccidly coriaceous, lorate,

yellow, margins ı pyriform

2 A. Hil... scape few fld, lateral urved spur under the inguis *Reichb f Xen* rrhynchium labrosum, *Lindl in Paxt Fl Gard* i 142

TENASSERIM, at Moulmein *Parish*, &c The KHASIA MTS, at Nurtiung (*Ic Jerdon*)

Leaves 5–8 by ⅓–¾ in keeled, greenish brown, flowers 4–6, owish with broad red brown or spur adnate, recurved, as long the lobes superposed, strap of pollinia short gland large

3 **A. Clarkei,** *Rolfe in Gard Chron* 1888, ii 567, scape few fld, sepals and petals linear-spathulate obtuse *Bot Mag* t 7077 Esmeralda Clarkei, *Reichb f in Gard Chron* 1886, ii 552

SIKKIM HIMALAYA, alt 6000 ft *Clarke* BHOTAN (*Ic in Hort Calcutt*)

Stem 12 18 in, stout *Leaves* 5–6 by 1¼–1½ in, flaccidly coriaceous lorate, unequally obtusely 2-lobed *Scape* 2–3 fld, flowers 3½ in diam, yellow barred with pale cinnamon brown, lateral sepals and petals falcate, dorsal sepal erect, lip half the length of the sepals, base narrowed, side lobes short, broad obtuse, midlobe ovate cordate, obtuse, ridged, column speckled with red *Capsule* 2½ in, oblong very thick

** *Flowers panicled Side lobes of lip nearly equalling or exceeding the midlobe*

4 **A. Maingayi,** *Hook f*, lateral sepals broadly obovate, dorsal narrower petals linear spathulate falcate, side lobes of clawed lip quadrate, midlobe as long oblong fleshy, spur red beneath

5 A. moschifera, ...

PERAK, alt 4–6000 ft, *King's Collector* —DISTRIB Java, Borneo

Stem 4–6 ft, as thick as a swan's quill, sheaths smooth *Leaves* 4–7 in, loriform or linear-oblong tip narrowly notched *Panicle* 2 3 ft, branches very short, divaricate, 2–3 fld pedicel with ovary 1 in flowers 3 4 in diam, dark green or yellow barred with maroon upper margin of side lobes recurved, anther broad, truncate, pollinia very large, flattened strip broad with a median ridge

53 PHALÆNOPSIS, *Blume*

Epiphytes, stem short, leafy, pseudobulb 0 *Leaves* distichous, coriaceous *Scape* lateral flowers usually large loosely racemed *Sepals* widely spreading *Petals* narrower or broader *Lip* clawed or sessile, adnate to the base or foot of the column, side lobes erect midlobe various, spur 0, disk variously appendaged with usually a forked plate or callus *Column* suberect foot long short or 0 anther 2 celled, pollinia 2, sulcate or 2 partite, strap linear or spathulate gland large or small — Species about 25 Indian and Malayan

The genus requires revision and a careful examination of the lip which is very imperfectly figured and described by the authors who have had access to living specimens The beautiful *P amabilis* has been sent from Singapore, where it is cultivated

* Lateral sepals inserted by a narrow base to the base or very short foot of the column

† *Rachis of raceme compressed, bracts fleshy distichous*

1 **P. Cornu-cervi,** *Par & Reichb f in Hamb Gartenz* 1860, 116, scape 6–10 in flowers 2 in diam yellow-green barred with brown *Rolfe in Gard Chron* 1886 ii 276 Polychilus Cornu cervi, *Breda Orchid Jav.* t 1, *Bot Mag* t 5570

TENASSERIM at Moulmein *Lobb, Parish* PERAK, *Scortechini* — DISTRIB. Sumatra Java Borneo

[illegible] 5 in, [illegible], lip [illegible] each [illegible] sword [illegible]

2 **P. violacea,** *Teysm & Binn in Batav Nat Tydschr* xxiv (*reprint* 10), scape 2–12 in, flowers 1 in diam *Reichb f in Gard Chron* 1878, ii 234, 1881, ii 145, fig 32 187, *Warner Orchid Album* t 182, *Flor Mag* N S t 312, *Rolfe in Gard Chron* 1886 ii 277, *Ill Hortic* 1855 173 (var *Schrœderi*) Stauritis violacea, *Reichb f in Hamb Gartenzeit* 1802, 34

PERAK (*Ic Scort* [illegible]
Leaves 4–10 in, [illegible]
bracts ovate, acute, [illegible]

purple the midlobe purple, Warner's figure has a very short scape, few flowers a violet lateral sepal with cream-cold inner margins, cream cold dorsal sepals and petals, and a violet lip According to Reichenbach the raceme is sometimes branched — Perhaps two species are confounded under *violacea*

†† *Rachis of raceme terete*

3 **P. Lowii,** *Reichb f in Bot Zeit* 1862, 214, *in Gard Chron* 1862, 979, *Xen Orchid* ii t 151, petals fan shaped very much larger than the oblong sepals, rostellum much longer than the column *Bot Mag* t 5351, *Fl des Serres*, t 1910, *Warner Select Orchid Ser* 2, t 15, *Rolfe in Gard Chron* 1886, ii 276

TENASSERIM, at Moulmein, *Parish*

e with lax fld raceme
, sepals white dorsal
le base, lip sessile, as
ll uncinately recurved
the tip purple, disk
the base of the side
n and rostellum pale

purple

4 **P. Mannii,** *Reichb f in Gard Chron* 1871, 902, 1876, 503, [illegible] oblanceolate, lip clawed, side
truncate with two spreading
Rolfe in Gard Chron 1886,

ASSAM, *Mann*

Leaves 6–10 in, oblong lanceolate *Scape* 12 in, branched, flowers many, scattered, 1½ in diam; sepals and petals yellow blotched with brown, lip white with purple blotches disk with a forked appendage at the base of the midlobe, in front of which is a flattened sword shaped spur, foot of column very short —Flower and appendages of lip very like those of *P Cornu cervi*, in both the column is long, the pollinia ellipsoid

5 **P. speciosa,** R ... *in Gard Chron* 1881 ... 560, 1890 ...

ANDAMAN ISLANDS, *Berkeley*

Leaves 8–12 in, obovate oblong or -lanceolate *Scape* tall, simple or branched, flowers 2 in diam, scattered, white or rosy with darker blotches, lip with a forked callus, column long, tip toothed, foot very short, pollinia oblong —Var *Christiana*, R f., has rose madder sepals and white petals, var *purpurata*, R f, has rose purple flowers

6 **P. tetraspis,** *Reichb f Xen Orchid* ii 146, *in Gard Chron* 1881, ii 562, 656, flowers as in *P speciosa*, but waxy white with 2 2-awned basal calli on the hairy disk. *Rolfe in Gard Chron* 1886, ii 277

ANDAMAN ISLANDS, *Col Man* —DISTRIB Sumatra

Leaves 12 by 2–4 in, cuneately obovate *Scape* tall, stout, branched —I have seen no flower of this

7 **P. Kunstleri,** *Hook f*, sepals obovate apiculate, petals rather smaller, tip rounded, lip shortly clawed, side lobes small broadly cuneate truncate, midlobe obovate with 7 thick parallel ridges, tip rounded.

PERAK, *Kunstler*

Leaves 4–6 in, obovate oblanceolate or elliptic lanceolate, acute, pale green *Scape* about equalling the leaves, 2–3-fld. at the tip; bracts very small, ovate; flowers

1 in diam, sepals and petals dull yellow green mottled closely with dull red for the basal half, lip small, white, side lobes erect streaked with red, midlobe red purple between the ridges, forked appendage small, with a 2-lobed callus behind it, column about half the length of the lip, pollinia globose, strap short, cuneate, gland quadrate —Described from dried flowers and a drawing of the whole plant in Hort Calcutt

** Lateral sepals inserted by a broad base on the elongate foot of the column

8 **P. Esmeralda,** *Reichb f in Gard Chron* 1874, ii 582, lateral sepals orbicular ovate, petals broadly obovate claw of lip long geniculate with two narrow recurved auricles side lobes broadly falcately obovate, midlobe oblong *Rev Hortic* 1877, t 107, *Warner Orchid Alb* vii t 21 *Floral Mag* N S t 358, *Rolfe in Gard Chron* 1886, ii 276, *Orchidoph* 1881, t 9 P antennifera, *Reichb f in Gard Chron* 1878, 398, 1882, 520, *Rolfe l c* 1886, ii 276

BURMA, *Hort Low* —DISTRIB Cochin China

Leaves 4–6 in *Scape* 1–2 ft, simple or branched, slender, rachis elongate, flowers 1 in diam, amethystine, side lobes of lip erect, appressed, red-purple, disk with a 2-awned callus in front of the auricles, and a raised thickened fleshy ridge from the base of the side lobes to the tip of the midlobe

9 **P. Parishii,** *Reichb f in Gard Chron* 1865, 410, 1871, 802, *Xen Orchid* i 144, t 150, f 1 *in Saunders Refug Bot* t 85, flowers small, lateral sepals subrotund, lip short sessile, side lobes small falcate, midlobe much broader shortly stipitate reniformly cordate *Bot Mag* t 5815, *Rolfe in Gard Chron* 1886, ii 276

EASTERN HIMALAYA, *Lobb, Mann* CACHAR, *Keenan* TENASSERIM, *Lobb*

Leaves 3–5 in, linear or obovate oblong *Scape* 3–4 in, 6–8-fld, flowers ½ in diam, sepals and obovate petals cream cold, lip mobile purple brown, disk with a narrow 4 awned appendage at the base overlapping a much broader ciliate lamina; rostellum 3-partite —The figure in Saunders' Refug is of var. *Lobbii*, R f, which has a white lip with two chestnut bands

SPECIES OF DOUBTFUL POSITION

[illegible]

54 DORITIS, *Lindl.*

Characters of *Phalænopsis*, and having the same 2-awned plate on the disk of the lip, but the column is narrowly winged, its foot longer forming a spur like mentum with the side lobes of the lip —Species 5, Indian and Malayan

D pulcherrima, *Lindl in Wall Cat* 7318 (*Gen & Sp Orchid* 178, *Reichb f. Xen Orchid* ii 7), a Siam species with flowers nearly 1 in diam in a panicle 2–3 ft. long, probably occurs in the Straits region

1 **D. tænialis,** *Benth in Gen Plant* iii 574, scape short few-fld, mentum acute, side lobes of lip very narrow spathulate reflexed on the disk, tips of the forked appendage of the lip hooked Ærides tæniale,

Lindl Gen & Sp Orchid 239, *in Journ Linn Soc* iii 41 Æ carnosum, *Griff Notul* iii 365, *Ic Plant Asiat* t 338 A

Subtropical Himalaya, from Kumaon, alt 3–6000 ft, eastwards to Bhotan,

Leaves few, 3–5 in,
ase, soft when dry.
purple, midlobe of

2 **D. W**... te simple
or branche ..., midlobe
obcordate ... Ærides
latifolium *Thwaites Enum* 430

Eastern Himalaya, Sikkim (*Ic in Hort Calcutt*), Bhotan, *Lister* Chittagong (*Hort Calcutt*) Burma, Moulmein, *Parish* Mougong *Griffith* The Circars, *Heyne* Malabar *Wight* &c Ceylon, *Thwaites*

Habit of *D tænialis*, but leaves rather larger, scape much longer, and lip very different

55 RHYNCHOSTYLIS, *Blume*

very thick, linear,
emes, bright cold
at the base *Lip*
of sac pubescent
awed dilated limb
Column short stout foot 0, rostellum shortly beaked, anther imperfectly 2 celled, pollinia 2 subglobose, 2 cleft, strap filiform, gland small — Species 2 or 3, Indian or Malayan

R. retusa, *Blume Bijdr* 286 t 49, leaves deeply channelled keeled

Tropical Himalaya from Garwhal eastwards to Assam and Tenasserim and southwards to Bengal, the Western Peninsula and Ceylon — Distrib Malay Islands

Stem stout, creeping in trees *Leaves* 6–20 by 1/2–2 in, curved *Racemes* 4–18 in; bracts broad, obtuse, membranous; flowers 1/2–3/4 in diam, white blotched with pink or violet; lateral sepals gibbously orbicular ovate, obtuse or apiculate, dorsal oblong,

petals elliptic, obtuse, epichile of lip very variable in size, usually cuneiform, entire or emarginate at the tip, di k flat or obscurely channelled *Capsule* 1-1½ in clavate — Lindley errs in d scribing the fruit of *R Garualica* as different from *R retusa*, also in describing the blade of the lip of *Sacc guttatu* as lanceolate, which misled Wight, who founded his *S Rheedii* on the d fference

SPECIES UNKNOWN TO ME

SACCOLABIUM BERKELEYI *Reichb f in Gard Chron* 1883, i 814, from the author's remarks (there is no description) this appears to be near *R retusa*, but the lip is acute, the flowers are white with amethyst spots Its habitat is unknown, but probably Indian

SACCOLABIUM LITTORALE *Reichb f l c* 1881 ii 198 has very long leaves, a short raceme, and the epichile cucullate keeled and turned obliquely on one side

56 SARCOCHILUS, *Br*

Epiphytes, stem short or long, pseudobulbs 0 *Leaves* distichous, or 0 at flowering time *Flowers* racemose or spicate *Sepals* spreading, lateral by a broad base to ually narrower *Lip* ill or large fleshy or it callus disk very various with often a callus or spur within *Column* short or long foot more or less produced anther 2 celled pollinia 2, sulcate or 4 in pairs, strap short broad. *Capsule* usually long strict, slender —Species about 10 known, tropical Asiatic, Australian and Pacific

A polymorphous genus no doubt to be dismembered when better known The following attempt to group the Indian species possibly indicates the lines upon which some of the genera may be established

A Flowers loosely inserted all round the rachis of a more or less elongate raceme or spike

* *Lateral sepals inserted by a narrow base to the base of the column or base of the column and sides of the lip Foot of column 0 or very short*

Sect I *Lip* shortly clawed *Column* short, rostellum minute PTEROCERAS, *Hasselt* (Sp 1-4)

Sect II *Lip* sessile or subsessile *Column* long, rostellum very long, slender STEREOCHILUS *Lindl* (Sp 5)

Sect III *Lip* long-clawed *Column* short, rostellum very short (Sp 6-7)

Sect IV *Stem* elongate, scandent *Lip* sessile *Column* short, rostellum very long, strap of globose pollinia very slender, gland minute MICROPERA, *Lindl* (Sp 8 11)

** *Lateral sepals inserted by ... base to the elongate foot of the column*

Sect. V. Leafless when flower ... le lobes of l ... , erect, mid lobe a tomentose pulvinus CHIL ... (Sp 12-15)

Sect VI Leafing and flowering ... ious (S ...)

B Flowers in very short sp kes ... der se ... persistent, imbricate

Sect VII FORNICARIA (Sp

C Flowers distichous on a ... on the uniform persi tent laterally co ...

Sect VIII *Peduncles* stout ... the column CUCULLA (Sp 2

Sect IX *Peduncles* filiform

Sect I PTER

1 S. suaveolens,

... lobes of l... falcate ... midlobe decurved with a re-
... rnitharium stria-
...) Ornithochilus
... f Xen Orchid
ii 121, 123 t 140 (*excl syn*), *in Trans Linn Soc* xxx 136

CHITTAGONG, *Roxburgh* TENASSERIM at Moulmein, *Parish*
Stem slender, scandent *Leaves* 3 5 by 2/3–3/4 in, many nerved, coriaceous, base

2 **S. muriculatus,** *Reichb f in Gard Chron* 1881, ii 198, leaves 6–9 in lorate racemes very short peduncle and rachis viscid, lip shortly clawed saccate side lobes broadly ovate obtuse, midlobe small obtusely 2 partite pubescent

ANDAMAN ISLANDS *Kurz Berkeley*
Stem 6–8 in stout, rooting below *Leaves* 1–in broad, obliquely notched or 2 lobed, lobes rounded *Scape* with raceme 2½–3 in, strict, bracts broad, obtuse, flowers about ½ in diam light yellow sweet scented, sepals and petals with two purple bars, column rather long, anther ovate, pollinia globose, strap short flat, gland small —The lip is that of Sect II.

3 **S. stenoglottis,** *Hook f*, stem very short stout, leaves broadly lorate, tip broad rounded emarginate peduncle shorter than the leaves pendulous many fld, sepals subsimilar oblong obtuse, petals as long narrower obovate oblong acute lip nearly as long as the sepals very narrow laterally flattened curved shortly clawed with two small rounded auricles beyond the claw, an elongated cup with toothed margins along the top and an ellipsoid compressed terminal spur

? PERAK, *Scortechini* —DISTRIB Sumatra *King's Collector*
Stem as thick as the thumb *Leaves* decurved, 6–10 by 1½-2 in, nearly flat *Peduncle*, 3 in stout, deflexed, dull purple, bracts very small ovate, pedicel with ovary ½ in, flowers ⅓–⅔ in diam very pale primrose; sepals and petals many-nerved lateral sepals with faint red bars near the base, lip white the elongated

Described from similar materials as *S aureus*

4 **S. brachyglottis,** *Hook f*, stem very short, leaves elongate

and obtusely ... lobed in front, column very short subglobose, foot 0

PERAK *King's Collector*
Stem 1 2 in curved *Leaves* 4–8 by 1–1½ in, pendulous, finely acuminate

that the sides are almost in contact, leaving a narrow slit along the top as the opening to the cavity; of the three short lobes seen in looking sideways at it, that towards the column represents the side lobes, a shorter below it a spur? and the intermediate the apex of the lip, there are no internal caruncles or sepals, the edges of the lip are smooth and yellow, and there are a few red spots on the side, column with a narrow base, very oblique top, sloping backwards, and very concave face; rostellum

Sect II STEREOCHILUS, *Lindl* (gen) (See p 33)

5 **S. hirtus,** *Benth in Gen Plant* iii 576, leaves lorate very thick straight horizontal, raceme pubescent, lip a conical sac with short acute 2 toothed side lobes and a large double callus below the column within Stereochilus hirtus, *Lindl in Journ Linn Soc* iii 58

KHASIA MTS, alt 5000 ft *J D H & T T* TENASSERIM, *Parish*

Stem very short *Leaves* 3–5 in, very thick *Racemes* 1–3 in, drooping; peduncle and rachis slender, bracts short, broad, membranous, flowers ⅓–½ in diam,

callus below the column is that of *Cleisostoma*, and the strap and stipitate pollinia are those of *Saccolab* § *Uncifera*

Sect III (See p 33)

6 **S. aureus,** *Hook f*, stem very short, leaves large long loriform

PERAK, *King's Collector*

Stem as stout as the little finger *Leaves* 4–10 by 1½–2 in, very coriaceous, keeled *Peduncle* from below the leaves, 2 7 in, stout, nearly straight, flowers scattered towards the end of the peduncle, bracts very short, broadly ovate, per-

column stout, rostellum inconspicuous, anther very shortly beaked, pollinia globose, strap subspathulate, gland narrow —A beautiful species, described from several drawings lent by Herb Calcutt and the analysis of dried flowers

7. **S. cladostachys,** *Hook f*, stem very short, leaves loriform tip narrowed bifid, peduncle much shorter than the leaves clavate few-fld, sepals and petals narrowly elliptic lanceolate finely acuminate, lip shorter than the sepals, claw narrow rigid linear, side lobes oblong obtuse, midlobe 3-fid, side lobules quadrate retuse, mid-lobule (spur?) short rounded.

MALAYA, *Kunstler* (*Ic in Herb Calcutt*) ? PERAK, *Ic Scortechini*.

Stem 1 in, not very stout *Leaves* recurved and pendulous, 6–12 by 1½–2 in, flat, keeled *Peduncle* 1½ in or more, green, bracts ovate, pedicel with ovary ¾ in.; flowers white, 1½ in. diam; sepals ¾ in. long, and petals spreading, cream cold;

Sect IV Micropera *Lindl* (gen) (See p 33)

vers pale
es 0, sac
. pallida,
at 7329,
iii 37,
vi 881

Khasia Mts, near Churra Silhet and Chittagong, *Roxburgh Wallich*, &c
Stem 2–3 ft as thick as a goose quill *Leaves* 3–4 by ½ in, obtusely 2 lobed, toothed or notched *Racemes* equalling or exceeding the leaves laxly many fld, bracts short broad, flowers ½–¾ in diam, sepals and rather smaller petals very obtuse, beak of column turned on one side, flexuous *Capsule* 1½–2 in long, slender

9 ... l rather
dense, ed, side
lobes icropera
pallid *part*),
Gen c *Soc* iii
37 Ærides pallidum *Roxb Fl Ind* iii 475 (*not of Lindley*)

Bengal, at Comilla *Clarke* Chittagong *Roxburgh*, &c Tenasserim, at Mergui *Griffith* (*Kew Distrib* 5211), *Helfer* (*K D* 5?01)
Stem 2–3 ft *Leaves* 2–3 by ½ in tip rounded, notched *Peduncle* with raceme
diam, sepals and petals
traight The *Micropera*
heet of *S purpurea* one
ut there are specimens of

10 S obtusus ...

Tenasserim at Moulmein, *Griffith, Parish*
Stem 6–8 in, not so thick as a goose quill simple or branched *Leaves* 2 3 by ⅗ in, subacute, keeled, often recurved *Raceme* subsessile, lax-fld bracts broad, acute, flowers ½ in diam, pale rose cold, sepals and petals linear oblong obtuse, lip yellowish with a subsaccate decurved apex, mouth with an exserted anticous lamella, midlobe minute 3 toothed; beak of column long, obliquely incurved

11 **S. Mannii,** *Hook f*, raceme very short sessile few fld, lip slipper-shaped obtuse decurved side lobes obtusely triangular incurved, anticous scale truncate, close under the fleshy entire tip

Khasia Hills alt 2–3000 ft, *Mann*
Stem as thick as a goose quill *Leaves* very coriaceous, 4 by ⅓–½ in *Raceme* ½–¾ in long, flowers ¼ in diam apparently pale; sepals and petals spathulately

oblong, lip with the claw as long as the saccate portion.—Very much stouter and larger more coriaceous-leaved than *S. obtusus* *Lip* with a ridge along the posticous face.

Sect V CHILOSCHISTA, *Lindl* (gen) (See p 33)

12 **S. usneoides,** *Reichb f in Walp Ann* vi 497, racemes elongate many-fld, flowers white, capsule 1¼–2 in Chiloschista usneoides, *Lindl in Wall Cat* 7330, *Gen & Sp Orchid* 219, *Bot Reg under* t 1522, *Sert. Orchid Frontisp* f 4, *in Journ Linn Soc* iii 43, *Gard Chron* 1846, 135. Thrixspermum usneoides, *Reichb f Xenia*, ii 120

TROPICAL HIMALAYA, Nepal, *Wallich* SIKKIM, *J D H*

slender setæ, pollinia 2, 2 lobed, strap very short broad, gland large *Capsule* slender, slightly curved, glabrous

13 **S. luniferus,** *Reichb f in Gard Chron* 1868, 786 (Thrixspermum), racemes elongate, many fld flowers yellow spotted with purple Sarcochilus luniferus, *Bot Mag* t 7011

SIKKIM HIMALAYA, *J D H*, at Mungpo (*Ic in Hort Calcutt*) TENASSERIM, at Moulmein *Parish*

Except in the colour of the flowers I can find no difference between this and *S usneoides*, the authority for the colours of which latter is a drawing made by Wallich's artists during his visit to Nepal, and another in Sikkim Parish observes that very small leaves are sometimes produced, and these have been seen in Kew Gardens

14 **S. Wightii,** *Hook f*, racemes short few-fld, flowers white or cream coloured, capsule ¾ in long
(*excl the left hand figure*) (*not of*
Retzii, *Lindl Gen & Sp Orchi*
vi 49 Limodorum pusillum

MALABAR, at Cochin, *Johnson* NILGHIRI HILLS, on the western slope of the

, capsule ⅓ in long

, very minute. *Raceme*
nearly as large as the lateral sepals. *Capsule* much curved, pubescent —The specimens are insufficient for a further description

Sect VI. (see p. 33)

16 **S. Berkeleyi,** *Reichb f in Gard Chron* 1882, 557 (Thrixspermum), raceme elongate decurved, lip long clawed produced into an elongate clavate laterally compressed obtuse spur with an inflated tip, side lobes small erect, midlobe minute incurved.

NICOBAR ISLANDS, *Berkely*

Leaves 6–9 by 1–1¼ in, lorate narrowed from above the middle to the base,

Ærides

17 **S. leopardinus,** *Par & Reichb f in Trans Linn Soc* xxx 145
than the leaves,
lobes wing like

TENASSERIM; at Moulme n, *Parish*

Stem 2–3 in, curved *Leaves* 4–6 by ⅔–1 in lorate fleshy, narrowed from the middle downwards obtuse many nerved *Peduncle* very stout, lower sheaths annular, bracts short broad obtuse flowers yellow spotted with purple, sepals
mn, dorsal smallest,
g fleshy round based
with purple, anther

18 **S. viridiflorus,** *Hook f* stem very short leaves 2 by ⅔ in falcately oblong raceme shorter than the leaves 4–8 fld, lip narrowly clawed, side lobes falcate obtuse as long as the cylindric obtuse spur, midlobe reduced to a broad humid caruncalate lobe Ærides viridiflorum, *Thwaites Enum* 430

CEYLON, on trees in the Central Province, *Gardner* (C P 3385), *Trimen* (C P 4016)
ng few fld,
pals broadly
mn for half
long obtuse

19 **S. hirsutus,** *Hook f*, stem short leaves lorate emarginate base narrowed, peduncle and very short raceme hirsute, lateral sepals ovate obtuse, petals oblong obovate lip very short stipitate on the prolonged foot of the column, side lobes elongate falcate, midlobe laterally compressed, disk with a broad transverse plate in front of the side lobes

basal lateral sepals

Sect VII FORNICARIA, *Benth in Gen Plant* iii 575 (See p 3")

20 **S. Hystrix,** *Reichb f in Walp Ann* vi 500, peduncle about as

long as the short loriform leaves bracts erect subulate lanceolate, side lobes of the lip glandular hairy Dendrocolla Hystrix, *Blume Bijdr.* 291 Ærides Hystrix, *Lindl Gen & Sp Orchid* 242 Thrixspermum Hystrix, *Reichb f in Trans Linn Soc* xxx 115 Grosourdya Hystrix, *Reichb f Xen Orchid* ii 123, *in Bot Zeit* 1864 297

TENASSERIM, at Mergui, *Griffith* (*Kew Distrib* 5232), *Parish* —DISTRIB Java

Stem 1–3 in *Leaves* 2–3 by ⅓–½ in, obtusely 2 lobed, sheaths ribbed *Peduncle* 2–3 in stout or slender 2–3 sheathed, spike ⅓–½ in, flowers white, sepals and petals ¼ in long, lanceolate, acuminate, lip stoutly clawed spotted with yellow, base saccate, side lobes triangular, midlobe truncate glandular pubescent within, column very short, anther broad, pollinia 2 bipartite or 4 in very unequal pairs, strap broad, gland rounded. *Capsule* 2½–4 in, linear, straight —Reichenbach is my authority for this being a Javan plant, and for the Javan synonymy.

21 **S. pulchellus,** *Trim Cat Ceyl Plants* 89, characters of *S Hystrix*, but side lobes of lip glabrous Dendrocolla pulchella, *Thwaites Enum* 430 Cylindrochilus pulchellus, *ibid l c* 307

22 **S. hirtulus,** *Hook f Ic Plant ined* peduncles hirtulous, much shorter than the falcately lanceolate obtusely acuminate leaves, bracts minute, spur long incurved, column very long contracted at the base

PERAK, *Scortechini* MALACCA *Maingay*

Stem very short, or 0 *Leaves* 3–5 by ⅓–⅔ in, coriaceous, falcate, narrowed from the middle downwards tip recurved *Peduncle* ½–1 in, spike ⅕–¼ in, bracts spreading, flowers membranous, lateral sepals ¼ in long, obovate oblong, acute 3 nerved, petals narrower, lip clawed, side lobes very narrow, elongate recurved, midlobe much broader than long formed of two falcately recurved lobes with an intermediate tooth, spur swollen above the narrow apex, anther shortly beaked, pollinia 2 globose stipitate on the cuneiform strap, gland minute *Capsule* 1½ in, very slender —A curious little plant with a longer column than usual in the genus

23 **S. recurvus,** *Hook f Ic Plant ined*, peduncles much longer than the shortly loriform leaves, spike oblong, bracts broadly ovate densely imbricate acuminate recurved

PERAK, Limbo Hills, in Larut, *King's Collector*

Stem very short *Leaves* 1–2 in, narrowed to the base, obtuse or retuse *Peduncles* 4–5 in, rather stout, spike ½–⅔ in, bracts very coriaceous, flowers not seen

24 **S. trichoglottis,** *Hook f Ic Plant ined*, stem elongate, peduncles shorter than the shortly loriform leaves, spike short, bracts ovate lanceolate, lip sessile saccate hirsute within, side lobes rounded hairy on both surfaces, midlobe a minute tooth

PERAK, *Scortechini King's Collector* SINGAPORE, *Ridley*

Hal

hairy –

who ba

pore

25 **S. filiformis,** *Hook f Ic Plant ined*, stem elongate, leaves

8-10 in filiform terete, peduncle much shorter than the leaves, lip a spur like cylindric sac with orbicular side lobes

PERAK, at Larut, on branches of trees, *King's Collector*

Flowers much like those of *S Trimeni* but habit very d fferent

26 **S. merguensis,** *Hook f Ic Plant ined*, stem short, peduncles much shorter than the small linear oblong leaves, bracts imbricate erect, capsule 1-1½ in linear terete beaked

diam, striate, beak $\frac{1}{12}$ in

Sect VIII CUCULLA, *Benth in Gen Plant* iii 575 (See p 33)

27 **S. lilacinus,** *Griff Notul* iii 334, *Ic Pl Asiat* t 320, f ii,

distiche amplexicaulis, *Reichb f in Bonplandia* ii 93 Thrixspermum amplexicaule & lilacinum, *Reichb f Xen Orchid* ii 121

MALAY PENINSULA, from Perak to Singapore in marshes —DISTRIB Malay Islands

2 in roots very · 8-10 in, sheaths gle l bracts ¼ in ral adnate to the p white, yellowish anther hyaline, *Capsule* 4-6 in,

28 **S. Sc...**

linear oblong and petals la shortly stipit papillose, disk with a columnar callus

PERAK, at Larut on branches of trees *King's Collector*
Stem and roots like those of *S lilacinus*, internodes 2 in *Leaves* 3-4 in, coriaceous *Peduncle* 2-3 in at right angles to the stem, raceme 1 in, bracts ⅛ in ensiform, subacute, sepals 1½ long and petals many nerved, margins of lip papillose

29 **S. Scortechini,** *Hook f* leaves oblong lorate 2 lobed, peduncle very long rather slender, sepals and petals lanceolate with long narrow tips, lip saccate, side lobes short, midlobe conical obtuse fleshy

PERAK, *Scortechini*

Stem 6 in, very stout, covered by the sheaths, internodes ¾ in *Leaves* 4–6 by 1–1¼ in, coriaceous *Peduncle* equalling or longer than the leaves (9 in in Ic Scort), raceme 2 in, bracts close set, ¾ in long sepals 2½ in long, ¼ in broad at the base and petals yellow, lip yellowish, thickly mottled with rusty red outside, pollinia 4, 2 much smaller, adnate to the larger, gland lunate, strap oblong *Capsule* 4–5 by ¼ in —I know these noble species only from a drawing and description by Scortechini.

30 **S. Arachnites,** *Reichb f in Walp Ann* vi 498, stem elongate, leaves loriform, peduncles shorter than the leaves, sepals and petals linear-lanceolate caudately acuminate 3–5-nerved, lip saccate, side lobes falcate, midlobe tongue shaped laterally flattened obtuse puberulous S serræformis, *Reichb f l c* Dendrocolla Arachnites, *Blume Bijdr* 287, t 67 Ærides Arachnites, *Lindl Gen & Sp Orchid* 238 Liparis serræformis, *Lindl in Wall Cat* 1940 *Gen & Sp Orchid* 33 (*excl Ceylon plant*) Thrixspermum Arachnites, *Reichb f Xen Orchid* ii 121

ASSAM, *Jenkins*, *Mann* KHASIA MTS, alt 4000 ft, *Clarke* TENASSERIM and TAVOY, *Wallich*, *Parish* PENANG, *Kunstler* (*Ic in Hort Calcutt*) —DISTRIB Java.

Stem 6–12 in, curved or tortuous, internodes short, roots most numerous and long *Leaves* 3–6 by ⅓–⅔ in *Peduncles* many, 2–4 in, solitary or in pairs, bracts ⅛ in; sepals and petals 1½ in, yellow, lip mottled with red, column very short; pollinia oblong, curved, strap very small, quadrate, gland still smaller, lunate *Capsule* 2–2½ in

31 **S. complanatus,** *Hook f*, habit, foliage and inflorescence of *S Arachnites*, but flowers very much smaller, sepals and petals ⅓–½ in

CEYLON, *Macrae*, *Walker* Ambagamowa and Saffragam districts, rare, *Thwaites*

Like *S Arachnites* I can distinguish it only by the very different flower and form of the lip, and for these characters I am indebted to a copy of a drawing in the Peradeniya Bot Garden The leaves vary from 2–7 by ¼–¾ in, obtuse or unequally notched, the peduncle from 1–3 in and the raceme from 1–5 in, capsule 2–2½ in, linear straight, pollinia 4 in unequal pairs narrow, quite distinct, and without strap or gland in the figure —There is a specimen of this in Herb Rottler, without habitat, named *Epidendrum complanatum*, Retz Obs vi 50

32 **S. brachystachys,** *Hook f*, stem rigid, sheaths ½–¾ in strongly ribbed when dry, leaves oblong, peduncle with the few fld raceme much shorter than the leaves, sepals oblong and obovate-oblong petals obtuse, side lobes of sessile lip falcate incurved, midlobe as long fleshy oblong, spur scrotiform

PENANG, on blocks of stone amongst decayed leaves, *Maingay*

Stem as thick as a goose-quill *Leaves* 2½–3 by ¾–1 in, obtuse, notched *Peduncles* at every node with the raceme 1 in, very stout, rigid, bracts 3–4, ¼ in. long, rounded, sepals and petals about 1 in long, keel narrowly winged, column very short, anther low, not beaked.

33 **S. pauciflorus,** *Hook f*, stem rigid, leaves rather distant oblong obtuse, peduncle much shorter than the leaves 2–3 fld, sepals oblong-lanceolate acute, petals nearly as large obovate-oblong obtuse, lip stipitate,

side lobes broad rounded obtuse, midlobe small fleshy obtuse with a conic callus at its base, sac or spur short recurved obtuse

PERAK, on the Larut range, alt 3000 ft, *Scortechini*

Stem $\frac{1}{4}$ in diam, flexuous *Leaves* $2\frac{1}{2}$–3 by $1\frac{1}{4}$–$1\frac{1}{2}$ in, coriaceous *Peduncle* with raceme 1 in, basal sheaths imbricate, bracts $\frac{1}{8}$ in, subacute, sepals $\frac{3}{8}$ in long, white, *lip yellow, with a broad lamella between the side lobes, column very short,* anther depressed, pollinia 2, each 2-lobed strap short

Sect IX. RIDLEYA gen ? (See p 33)

34 **S. notabilis,** *Hook f Ic Plant ined*, sepals and petals filiform from a narrowly lanceolate 3 nerved base, lip sessile at the base of the column deeply saccate, mouth dilated, tip contracted into a capillary tail

SINGAPORE, *Ridley*

Stem very short *Leaves* $1\frac{1}{2}$–2 in subsessile, elliptic oblong, strongly striate when dry *Peduncles* 3 or more from one point on the stem, $4\frac{1}{2}$ in long, curved, naked, raceme $2\frac{1}{2}$ in, rachis $\frac{1}{4}$ in diam across the ovate incurved coriaceous subacute bracts pedicel and ovary very slender $\frac{1}{2}$ in long, perianth very membranous, white? sepals and petals $\frac{3}{4}$ in long 3 nerved at the base, lip a large sac rounded at the base delicately veined, column very short, foot 0, anther low, membranous, [illegible] gular and genus, and [illegible] s, but the

SPECIES UNKNOWN TO ME OR IMPERFECTLY KNOWN

THRIXSPERMUM FREEMANI *Reichb f in Gard Chron* 1877, 749, dwarf, roots warted leaves 6 7 by $1\frac{1}{4}$ in ligulate unequally 2 toothed, racemes many fld, [illegible]

S SILLEMIANUS, *Reichb f in Gard Chron* 1882, i 524, habit of *Vanda teres,* leaves slender elongate terete peduncle 2 fld, bracts very short triangular, flowers [illegible]

[illegible] 2 in, curved, peduncle 1 in, [illegible] n, very slender —Khasia Hills, [illegible]

57 TRICHOGLOTTIS, *Blume*

Epiphytes, stem elongate, leafy *Leaves* distichous, flat, narrow *Flowers* in branched panicles or solitary or few in very short racemes *Sepals* and *petals* widely spreading oblanceolate or subspathulate *Lip* adnate to the sides of the very short column, narrow, base saccate or spurred, side lobes one or two pairs of narrow processes, midlobe straight, or decurved from the middle, hairy *Column* very short, sides produced into

2 spurs or horns, anther incompletely 2 celled, pollinia 2, globose, strap rather short, gland moderate —Species 3 or 4? Malayan

In the absence of good materials, I am doubtful as to the correctness of the above definition of *Trichoglottis* Bentham refers Blume s *T retusa* to *Saccolabium*, and by replacing that anthers character of "lip adnate to the whole length of the column, with a process on each side," by "lip adnate to the foot of the column and

1 **T. Dawsoniana,** *Reichb f in Gard Chron* 1872, 699, flowers panicled pale green spotted with brown or purple, sepals and petals cuspidate on the back below the concave tip lip saccate at the base tip 2 fid Cleisostoma Dawsoniana, *Reichb f in Gard Chron* 1868, 815

TENASSERIM, at Moulmein *Parish*

Stem 1 2 ft, stout, rooting *Leaves* few 3–6 by ¾–1 in *Panicle* 18 in, erect stiff, branches spreading, bracts broadly ovate pedicel with ovary ½ in, flowers 1–1½ in diam, anther 2 lobed crested pollinia large strap short slender —Near *T fasciata* R. f, erroneously supposed to be a native of Ceylon, of which there is a fine drawing in Hort Calcutt giving Manilla as the habitat

2 T. ... *Soc* xlv 156, ... mate, flowers ... ls similar but twice as long ... lobes reflexed linear 2 fid with a callus under the tip spur subobtuse rather longer than the midlobe

NICOBAR ISLANDS, forests of Kamorta *Kurz*

Leaves 2–3½ in base narrowed twisted *Flowers* leaf opposed, pedicel ½ in, sepals ¼ in long lateral subfalcate column very short, pollinia globose —Description from Kurz l c, I have seen no flowers

58 ÆRIDES, *Lour*

Epiphytes, stem leafy pseudobulbs 0 *Leaves* linear, coriaceous

sulcate, strap long or short, gland large or small —Species about 10, Eastern Asiatic

I am indebted for aid in determining the cultivated species of Sect ii. d in to Messrs Veitch for specimens, and to great knowledge of his assistant, Mr Kent, and of Mr Rolfe (of the Kew Herbarium) for valuable information respecting them

Sect I *Leaves* terete grooved in front (See also *Æ mitratum*) *Peduncle* 1–2 fld *Spur* slightly incurved, with a callus half way down the tube *Anther* shortly beaked

1 **Æ. Vandarum,** *Reichb f in Gard Chron* 1867, 997, 1875, 590,

J D H KHASIA HILLS, 0 ft *Watt*

¼ in broad, flat *Leaves* 1½–2 in diam white, perianth with crisped margins, sepals obovate oblong, petals broader, side lobes of lip flexuous as long as the cylindric spur, segments of midlobe orbicular, toothed, pollinia globose, strap narrowly cuneate, gland large *Capsule* 1½–2½ in, fusiform

2 **Æ.** leaves 6–8 in peduncle very elongate subulate mid lobe soclastes uniflora *Landl in H* Luisia uniflora *Blume Rum* id 3

the long spur segments curved forwards, outer shortest midlobe membranous, lobes divaricate *Capsule* 2 in fusiform, peduncle and pedicel very slender

3 **Æ. cylindricum,** *Landl in Wall Cat* 7317, *Gen & Sp Orchid* 240, leaves 2–6 in, peduncle short stout, side lobes of lip oblong obtuse, midlobe short cuneiform fleshy many-ridged *Wight Ic* t 1744, *Gard Chron* 1875 i 537, 1886, i 405 fig 81 Epidendrum subulatum *Retz Obs* vi 50 Limodorum subulatum, *Willd Sp Pl* iv 126 Cymbidium elegans, *Herb Heyne*

Sect II, *Leaves* lorate keeled (semi terete in *Æ mitratum*) Side lobes of *lip* very small, midlobe large, spur incurved

* *Lip horizontal or inflexed*

4 **Æ. mitratum,** *Reichb f in Bot Zeit* 1864, 415, leaves very long filiform, side lobes of lip minute uncinate, midlobe broadly ovate retuse, spur short inflated *Bot Mag* t 5728

TENASSERIM, at Moulmein (*Hort Day*)

above
minute,
rounded,
violet, spur contracted at the neck, inflated compressed, base truncate, obtuse, tip pointing forwards

5 **Æ. multiflorum,** *Roxb Cor Pl* iii 63 t 271, *Fl Ind* iii 475, midlobe of lip hastately ovate tip rounded, spur short straight *Belg Hortic* 1876, 286, *Walp Ann* vi 897 Æ affine, *Wall Cat* 7316,

Lindl Gen & Sp Orchid 239, *Sert Orchid.* t 15, *in Journ Linn Soc* iii 41, *Bot. Mag* t 4049, *Warner, Sel Orchid Ser* i t 21 Æ roseum, *Lodd, ex Paxt Fl Gard* ii 109, t 60 *Jard Fleur* ii t 200, *Gartenfl* viii 253, t 267, *Ill Hortic* iii t. 88 Æ Lobbii *Hort ex Ill Hort* 1868, t 559 (*an Teysm & Binn* ?) Æ Veitchii, *Hort ex Morren in Belg Hortic* 1876, 291, *Williams Man* 70 Æ trigonum, *Klotzsch in Otto & Dietr Allgem Gartenz* 1855, 177. Epidendrum geniculatum, *Herb Ham*

TROPICAL HIMALAYA, from Garwhal eastwards, the KHASIA HILLS, and southward to TENASSERIM

Stem 4–10 in, stout *Leaves* 6–8 in, deeply channelled and keeled, variable in breadth, 2-lobed *Racemes* 6–12 in, rarely branched, shortly peduncled; flowers ¾–1¼ in diam, rose purple, sometimes spotted with darker, sepals and petals subequal, oblong, tips rounded; lip twice as long, sides recurved, claw geniculately ... under it with an incurved ... beaked, anther longate, stoutly pedicelled — ...h's works In Griffith's Eastern Himalayan collections, a fruiting specimen of which is a different species, or perhaps a very large var of this or the following with leaves 12 14 by 1½ in, and a stout raceme 12 16 in, the capsules are of *multiflorum*

6. **Æ. Fieldingii,** *Lodd ex Morren in Belg Hortic* 1876, 286, t 10, characters of *Æ multiflorum*, but a much more robust plant, with a different habit of growth, and an acute apex of the hastate midlobe of the lip *Jennings's Orchid* t 20 *Reichb f in Hamb Gartenzeit* 1855, 225, *Morren Belg Hortic* 1876, 286 Æ Williamsi, *Warner Sel Orchid Ser* i t 21

SIKKIM HIMALAYA and ASSAM

I am indebted to Mr Kent, of Messrs Veitch's establishment, for calling my ... they are difficult of ... figures the flowers ... e flowered variety ... *rum*) is referred to ... Foxbrush Orchid of gardens

7 **Æ. maculosum,** *Lindl in Bot Reg* 1845, t 58, *in Gard Chron* 1845, 691, midlobe of lip ovate tip broad obtuse or retuse margins undulate, spur slender uncinately incurved *Paxt. Mag Bot* xii. t 49, *Walp Ann* v 897, *Pescatorea*, i t 33, *Lindenia*, i t 11 Saccolabium speciosum, *Wight Ic* t 1674, 1675

WESTERN GHATS, from the Concan to Travancore RAJPOOTANA, on Mt Abo

Near *Æ multiflorum*, but stem shorter, leaves more flat, racemes more often branched, flowers larger but very variable in size, pale spotted with purple, tip ... —Var *Schrœderi*, Jard Fleurist t 54; ... *Pescatorea*, t 36 Æ illustre, *Reichb f. in* ... th fewer shorter leaves, and large flowers

8. **Æ. crispum,** *Lindl in Wall Cat* 7319, *Gen. & Sp Orchid* 239, *in Bot Reg* 1841, t 55, *in Gard Chron* 1842, 711 (*with fig*), *in Journ Linn Soc* iii 41, midlobe of lip large broadly ovate-oblong obscurely

Ic t 1677 bis Lindl in Journ Linn Soc iii 41; Wall l c 879 A Brookeri Lindl in Gard Chron 1841 518, 1842, 559 Batem in Bot Reg 1841 Misc 55, Paxt Mag Bot ix t 145, Flore des Serres t 151 A Warneri, Hort

WESTERN GHATS, from the Concan to Travancore

Stem 4–10 in very stout *Leaves* 4–8 in from oblong to lorate variable in breadth, thickly coriaceous lobes unequal rounded *Racemes* 8–12 in inclined or drooping simple or branched, pedicels very robust, flowers 1½ in diam sweet scented sepals and petals very broad pale rose, lip geniculately inflexed at the claw rose or pur
projecting forwar
dilated above (
character where
more odorous than Æ odoratum

9 **Æ. falcatum,** *Lindl in Pa*
half as long as the clawed midlobe
ovate or ovate-cordate sides replicate
and concealed under it *Reichb f*
Belg Hortic 1876 288 *Walp Ann* vi 897 Æ Larpentae *Hort Makoy Prix Cour* 1862, *Reichb f in Otto & Dietr Garten* 1856 219 Æ retrofractum *Wall mss*

TENASSERIM *Wall ch Parish &c*

Stem 6–8 in robust *Leaves* 8–12 by 1 1½ in *Racemes* decurved or pendulous lax fid, flowers 1–1½ in diam, white pale violet purple or pink sepals and petals often tipped with a darker shade and lip usually darker, lateral sepals with a very broad base column beaked foot elongate, anther long beaked, strap of pollinia slender gland small

10 Æ [illegible]

** *Lip deflexed*

11 **Æ. radicosum,** *A Rich in Ann Sc Nat Ser* xv 65, t 1 c, stem short very stout leaves 4–10 by ¾ 1½ in unequally 2 lobed racemes or panicles very stout rarely exceeding the leaves sepals orbicular and rather smaller petals 5 nerved, side lobes of lip minute, midlobe ovate, disk with 2 large basal calli spur longer than the sepals stout incurved obtuse *Saccolabium Wightianum Lindl in Wall Cat 7303 (in part), Gen & Sp Orchid 221 (excl Syn) in Journ Linn Soc* iii 30 *(excl Khasia), Wight Ic* t 917 S rubrum *Wight Ic* 1673 *(not of Lindl)* S ringens *Lindl in Wall Cat* 7313, *Gen & Sp Orchid* 220, *in Journ Linn Soc* iii 36, *Walp Ann* vi 884

THE DECCAN PENINSULA, on the Nilghiri and Pulney Hills, and at Quilon *Wight &c*

Stem as thick as the thumb *Leaves* leathery, rigid, mottled with purple in

Wight's *S rubrum* *Peduncle* very short and stout, raceme simple or sparingly branched, rachis stout, bracts minute, flowers ¾ in diam, bright red in Wight's *S rubrum*, nearly white with rosy tips in his *S Wightianum*, spur about as long as the blade of the lip, incurved obtuse, anther beaked, strap of pollinia short, subtriangular, gland large *Capsule* ¾ in long, pyriform, angled and grooved

12 **Æ. lineare,** *Hook f*, stem short stout, leaves 6–12 by ½–¾ in very unequally 2 lobed panicle long peduncled much branched longer than the leaves, flowers as in *Æ radicosum* but rather smaller rose-cold Saccolabium lineare, *Lindl in Wall Cat* 7312 S paniculatum *Wight Ic* t. 1676, *Reichb f in Bonpl* iii 2'5 Cymbidium lineare, *Herb Heyne*

DECCAN PENINSULA, on the Ghats from Canara southwards, alt 5–7500 ft, *Wight*, &c CEYLON in the Dombera district, *Thwaites*

As far as I can judge from dried specimen *Æ lineare* is with difficulty distinguishable from *Æ radicosum* except by the more slender very much branched panicle and rather smaller flowers Wallich's specimens of *Sacc lineare* are very bad —The synonyms of this and the preceding may be mixed

Sect III *Leaves* lorate keeled Midlobe of *lip* incurved between the much larger side lobes

13 **Æ. odoratum,** *Lour Fl Coch* 525 lobes of leaf large rounded, lateral sepals much larger than the dorsal and petals midlobe of lip ... ose *Lindl Gen & Sp Orchid* 239, ... *Mag* 4139, *Paxt Fl Gard* ii t 143, ... iv t 180, *Knowles & West* t 75, ... vi 898 *Landenia*, t 14 (*var*) Æ cornutum *Roxb Hort. Beng* 63, *Fl Ind* iii 472, *Bot Reg* t 1485

TROPICAL HIMALAYA, Nepal *Wallich* Sikkim *J D H* The KHASIA HILLS, SILHET, CHITTAGONG and TENASSERIM The CONCAN, *Heyne in Herb Rottl* — DISTRIB Java China, Cochin-China

Stem 4–12 in, very stout *Leaves* 6–10 by ¾–1¾ in *Racemes* many, 10–12 in, peduncle and rachis stout, flowers purple to nearly white sweet-smelling, often purple spotted or -tipped, side lobes of lip subcuneate, midlobe short, spur very large, uncinately incurved column short, anther obtuse, strap of pollinia not long, linear, gland small *Capsule* 1–1½ in, oblong-clavate, angles obtuse, pedicel ½ in, very stout

VAR *bicuspidata*, midlobe of lip with a bicuspidate tip —MALACCA, *Maingay* (*Kew Distrib* 1648) PERAK (*Ic in Hort Calcut*) A specimen of this sent from Calcutta (Garden?) to Herb Hooker by Dr Carey is named by the latter *Æ cornutum*

14 ... *n Paxt Fl G*... the lip being ... *Chron* 1890, i 43, *Walp Ann* vi 898 Æ Reichenbachii, *Linden in Koch & Fintelm Wochenschrift*, 1858, 61, *Reichb f Xen Orchid* ii 11, t 104 Æ nobile, *Warner Sel Orchid Ser* 1 t 11, *Gartenfl* 40, t 641 Æ Rohanianum, *Reichb f in Gard Chron* 1884, i 206 Æ flavidum, *Lindl in Paxt Fl Gard* ii 101. Æ Ballantinianum, *Reichb f in Gard Chron* 1885, ii. 198

PENANG and BURMA

Said to be the sweetest scented species of the genus, but more definite characters are wanting to distinguish it from *Æ odoratum* The sepals and petals are rosy with often darker tips, the spur yellow mottled red *Æ Ballantinianum* is an early flowering form

15. **Æ. Emericii,** *Reichb f in Gard Chron.* 1882, 586, lobes of

leaf long narrow subacute, sepals longer than the petals, midlobe of lip lanceolate acute

ANDAMAN ISLANDS, *Berkeley*

Stem 6–8 in *Leaves* 10–12 by ¾ 1½ in lobes much longer than in *Æ odoratum* *Racemes* 6–8 in, flowers ½ in diam, pale lilac pedicels 1 in, side lobes of lip rounded, entire, spur short, stout foot of column very short anther shortly beaked, strap of pollinia long linear —Much the smallest flowered of the Indian species

SPECIES UNKNOWN TO ME

Æ BORASSI *Ham ex Smith in Rees Cyclop* xxxix No 8 is undeterminable

[illegible] 365 (*without descript*), *Ic Plant Asiat*

c m 423 from Mogoung in Burma

acute, many nerved, peduncles several,

gular, pedicels with ovary ¾ in erect, flowers ¾ in diam, lateral sepals very broad obtuse —This has the habit of a *Phalænopsis*

Æ LASIOPETALUM *Willd Sp Pl* iv 130 is undeterminable

Æ falcatum

[illegible]

59 RENANTHERA, *Lour*

Epiphytes, stem elongate, branched, leafy, pseudobulbs 0 *Leaves* rigid, 2 lobed *Flowers* large or medium sized, in lateral spreading panicles *Sepals* narrow, widely spreading dorsal erect lateral deflexed

ilate at first parallel or

jointed on the base of

short, truncate, foot 0,

ort, gland transverse —

1. **R. coccinea,** *Lour Fl Cochin Ch* ii 637, flowers 2–2½ in diam, lateral sepals free, much larger than the dorsal, midlobe of lip ovate-lanceolate recurved *Lindl Gen & Sp Orchid* 217, *Bot Reg* t 1131, *Bot Mag* t 2997–8, *Paxt Mag* t 40, *Reichb Fl Exot* t 114, *Walp Ann* vi 875

TENASSERIM; at the Moscos Isds, opposite Tavoy, *Parish* —DISTRIB Cochin China

2. **R. elongata,** *Lindl Gen & Sp Orchid* 218, flowers ¾ in diam, sepals subequal lateral free, midlobe of lip tongue shaped revolute with 2

basal calli *Reichb f Xen Orchid* i 88 *Walp Ann* vi 876 R matutina, *Lindl in Bot Reg* 1843, t 41 (*not of Gen & Sp*), *Prescatorea* i. t. 11 R micrantha, *Blume Mus Bot* i 60, *Reichb f l c* i 87 Saccolabium reflexum, *Lindl in Wall Cat* 7309, *Gen & Sp Orchid* 225

SINGAPORE *Wallich* PERAK *Scortechini*, &c MALACCA, *Griffith* (*Kew*

Islands

ender bracts ovate reflexed,

with red spots *Lip* with

ge cylindric, obtuse, some-

gland small *Capsule* 1 in,

fusiform, angles acute —King's collector describes the flowers as dark red

3 **R. angustifolia,** *Hook f Ic Plant ined* flowers $1\frac{1}{2}$ in diam, lateral sepals lanceolate abruptly clawed, at first connate midlobe of lip minute acute recurved

PERAK, on Gunong Bata Putch *Wray*

Stem as thick as a goose quill *Leaves* 4–5 by $\frac{1}{3}$–$\frac{1}{2}$ in and near recurved *Scape* long, sparingly branched, pedicel with ovary 1–$1\frac{1}{4}$ in lateral sepals inserted by a point, and narrower dorsal acuminate, side lobes of lip very small rounded spur con co-cylindric, top of column liquid pollen large oblong, strap broad gland large

SPECIES UNKNOWN TO ME

R HISTRIONICA, *Reichb f in Gard Chron* 1878 ii 74, low leaves lanceolate

60 VANDA, *Br*

mous, subglobose or obovoid, strap broad short or long geniculate, gland rather large (slender in § *Anotis* and gland small) —Species about 20, tropical Asiatic and Australian

Sect I EUVANDA *Sepals* and *petals* widely spreading (not incurved) *Lip* with erect side lobes *Strap* of pollinia flat, geniculate, gland large

* Leaves terete Scape few fld See also *Ærides cylindricum*

1 **V. teres,** *Lindl in Wall Cat* 7324, *Gen & Sp Orchid* 217, *Fol Orchid* 7, *in Bot Reg* t 1809, midlobe of lip 2 fid, lobes hatchet-shaped, sac long conical *Bot Mag* t 4114, *Part Mag* v t 193, *Griff Notul* iii 352, *Warn Sel Orchid Ser* iii t 2, *Reichenbachia* i t 27, *Rev Hortic* 1856, t 22 Dendrobium teres, *Roxb Fl Ind* iii 485

LOWER BENGAL, at Seeb Sagur, *Clarke* ASSAM, SILHET, the KHASIA HILLS, CHITTAGONG and UPPER BURMA, *Roxburgh*, *Wallich* &c

Stem many feet long branched, and leaves as thick as a goose-quill *Leaves* 6–8 in *Peduncle* 6–12 in, bracts short, ovate, flowers 3–6, 4 in diam, white or

rose-cold, sepals and petals undulate lip hairy towards the base, side lobes broad, incurved yellow within crimson spotted midlobe much larger, flabellately reniform purple or rose cold, sac 1 in long, column hairy in front *Capsule* 1 in, clavate

2 **V. Hookeriana,** *Reichb f in Bonpland* 1856 324, *in Gard Chron* 1882, ii 498, midlobe of lip very large reniformly flabellate 3 lobed, sac very short *Ill Hortic* 1883, t. 481 *Orchidoph* 1886, t. 158, *Reichenbachia*, ii t 71 *Warner Orchid Alb* t. 73, 1882

PERAK *Scortechini* in swamps *Wray* SINGAPORE *Ridley (in litt)*

flowers 3–5 2 in
als broader, lilac or
purple, midlobe as
sac conical, obtuse

Capsule 4 in

** *Leaves* flat or chanelled and keeled *Scape* usually many fld

† *Flowers* ½–1½ in diam (See also *V Bensoni*)

3 **V. parviflora,** *Lindl in Bot Reg* xxx *Misc* 45 peduncle and raceme strict erect, flowers ½ ⅔ in diam sepals oblong and spathulate
the sepals, midlobe cuneate obovate
disk with fleshy blue ridges, spur
lip *Wight Ic* t 1669 *Reichb f in*
ightianum *Lindl in Wall Cat* 7320,
Linn Soc iii 40, *Bot Mag* t. 5138,
Wight Ic v [illegible] *Bomb Fl* 265

WESTERN HI[illegible] ft *Edgeworth*
NEPAL, *Wallich* [illegible] NINSULA, from
the Concan to Tra[illegible]
Stem 4–6 in [illegible] *Peduncle* and
rachis stout, ped[illegible] ovate *Capsule*

V testacea *Reichb f in Gard Chron*
Sp Orchid 238, *Paxt Fl Gard* ii.

[illegible], sepals and petals white, lip white, ridges speckled with red spur broader obtuse —Moulmein (*Ic Parish*)

4 **V. cœrulescens,** *Griff Notul* iii 352, *Ic Plant Asiat* t 331

Chron 18[illegible], [illegible], 18[illegible], [illegible], t 97

UPPER BURMA, *Griffith* PEGU, on hills near Prome, alt 1500 ft, *Benson*
Stem 6 in *Leaves* 6–10 by ⅝ in, much broader in cultivation acutely 2 fid or 3 fid *Peduncle* with racemes 1 ft or less, pedicel with ovary 1–1½ in, flowers variable in colour, from blue to nearly white (vars *Boxallii*, R f and *Lowiana*, R f), spur and column blue

spathulatum, *Linn Sp. Pl* 1348 Limodorum spathulatum, *Willd Sp Pl.* iv 125 Ærides maculatum, *Smith in Rees Cyclop Suppl* —*Rheede Hort Mal.* xii. t 3.

WESTERN PENINSULA, from Malabar to Travancore and CEYLON

Stem 2 ft *Leaves* 2–4 by ½–1¼ in, shortly obtusely 2-lobed *Peduncle* 12–18 in, robust, few fld and at the tip only, bracts large, ovate, acute, pedicel and ovary 1–1½ in, side lobes of lip broadly obovate midlobe obscurely 3-fid, spur conical. *Capsule* 1½ 2½ in, clavately fusiform

†† *Flowers* 2 *in diam and upwards* (smaller in *V Bensoni*)

6 **V. cœrulea,** *Griff ex Lindl in Bot Reg* 1847, *under* t 30, *Fol Orchid* 8, peduncle elongate many fld, flowers 3–4 in diam pale blue, lateral sepals obovate, petals clawed broadly obovate, lip much shorter than the sepals dark blue linear oblong side lobes small rounded, midlobe with 2 thickened ridges ending in a bigibbous tip *Paxt Fl Gard* t 36, *Jard Fleurist* t 102 *Fl des Serres* t 609, *Reichb f Xen Orchid* i 8, t 5, *Pescatorea*, i t 29, *Ill Hort* vii t 246, *Warner Sel Orchid* t 18, *Jennings Orchid* t 31, *Reichenbachia*, ii 19, t 57, *Lindenia*, iv t 160 V cœrulescens, *Journ Hort Soc* vi, *Proc* vii *with fig* Vanda, *Griff Itin Notes* 88, No 1284

KHASIA and JAINTEA MI ou o [illegible] alt 4000 ft, *Griffith* &c

Stem 3–6 in, very stout *Leaves* 3 10 by [illegible] 1 in keeled 2-lobed or tip obliquely truncate and toothed *Peduncle* with [illegible] 6 20 fld raceme 1 2 ft, perianth segments somewhat waved and obscurely [illegible], lip not one-third the length of the sepals, spur conical obtuse [illegible] 3 in, fusiform long ped [illegible]lled

7 **V. Denisoniana,** *Benson & Reichb f in Gard Chron* 1869, 528, 1885, 105, f 21, peduncle very short, flowers 2 in diam, white, [illegible]

Lindenia t 21, *Warner Orchid Alb* t 218

TENASSERIM, at Moulmein *Parish* ARRACAN *Benson*

Stem short *Leaves* 6–10 in deeply unequally 2 lobed *Peduncle* stout, with the raceme 6–10 in, pedicels with ovary 2 in, midlobe of lip with rounded sides, and a very acute terminal sinus, disk with 5 thick obtuse ridges, side lobes concave, with orange streaks, spur short, villous within *Capsule* 3–5 in, clavately fusiform

8 **V. Bensoni,** [illegible]

1867, 180, *Flore des Serres*, t 2329

PEGU, near Rangoon *Benson* TENASSERIM, at Moulmein, *Parish.*

Stem short *Leaves* 4–6 in obliquely truncate and toothed. *Peduncle* with the raceme 18 in, midlobe of lip with 3 obtuse ridges, spur conical obtuse —Very near *V Denisoniana* but flowers much smaller, quite different in colour, not so waved, midlobe of lip more contracted, the terminal lobes uncinate —A form with brown flowers figured by Parish and called *tristis* may be this or *V brunnea* (see end of genus)

9. **V. Parishii,** *Veitch & Reichb in Gard. Chron* 1867, 180, *with fig*;

leaves broad obtusely 2 lobed peduncle short stout erect, bracts large, flowers 2 in diam, fleshy spotted mauve brown or purple lateral sepals broadly ovate oblong and orbicular petals apiculate lip half as long as the sepals, side lobes rounded midlobe small cuneately flabelliform *Reichb f Xen Orchid* ii 138, *in Gard Chron* 1870, 890, *Warner Orchid Alb* t 15, and 61 (var)

TENASSERIM, at Moulmein, *Parish*

Stem very short, stout *Leaves* few, 8–10 by 2 3 in *Peduncle* very short, raceme 6–8 in, drooping 6–8 fld, bracts acuminate, flowers variable in colour The short stems and broad flat leaves are not those of *Vanda* proper, and more resemble *Stauropsis* or *Arachnanthe* In var *Marriottiana*, Reichb f in Gard

10 **V. bicolor,** *Griff Notul* iii 354, *It Notes*, 132, No 516, *Ic. Plant Asiat* t 330 leaves præmorse, peduncle short erect 4–6 fld, flowers 2 in diam brownish purple obscurely tessellate, waved, lateral sepals obovate deflexed dorsal small, lip nearly as long as the sepals, purple side lobes large orbicular midlobe small panduriform tip contracted 2 lobed *Lindl Fol Orchid* 6, *Walp Ann* vi 867, *Reichb f in Gard Chron* 1875 620

EASTERN TROPICAL HIMALAYA, Sikkim (*Ic in Herb Calcutt*), Bhotan, alt 2000 ft *Griffith* ASSAM (*Ic in Herb Calcutt*)

Stem 2–3 ft *Leaves* 6–10 in, sometimes unequally rather obtusely 2-lobed *Scape* very stout, bracts ovate, acute dorsal sepal much the smallest, dilated in the middle, petals clawed spathulate, side lobes of lip margined with yellow *Capsule* almost a span long —Near *V Roxburghii*, but at once distinguishable by the large orbicular side lobes of the lip A little known species

11 **V. Roxburghii,** *Br in Bot Reg* t 506, leaves præmorse, raceme suberect, flowers 1½–2 in diam tesselated with brown sepals and

ly as long as the sepals,
violet tip dilated truncate
rchid 3, *Wight Ic* t. 916,
, *Reichb Fl Exot* t 121,
f in Walp Ann vi. 864
C tessellatum, *Swartz in*
Roxb Fl Ind l c C

Alagnata, *Herb Ham* Epidendrum tessellatum *Roxb Cor Pl* i 34, t 42 Ærides tessellatum, *Wight in Wall Cat* 7318, *Lindl Gen & Sp Orchid* 240 —Vanda, *Jones in Asiat Res* iv 302

BENGAL, BEHAR and westwards to GUZERAT and the CONCAN, and southwards to TRAVANCORE, TENASSERIM and CEYLON

botanists, and I suspect that the form of the lip of *C. tessellatum* is due to withering. Var. *unicolor*, Bot. Mag. t. 3416 is I suspect the Chinese *V. concolor*, Blume.

Sect. II. ANOTA, *Lindl.* *Raceme* dense-fld. *Sepals* and *petals* widely spreading. *Lip* without side lobes. *Strap of pollinia* long, slender, straight.

The two species of this section ... n referred to *Saccolabium*, *Vanda*, and ... hever genus placed they are aberrant; t... it the lip and strap of the pollinia is as ... that of *Vanda*, but rather of *Saccolabium*.

12. **V. densiflora**, *Lindl. in Paxt. Fl. Gard. under* t. 42; *Fol. Orch.* ...

Reichenbachia t. 22; *Jennings Orchid.* t. 8; *Lindernia*, f. 683; *Orchidopl.* 1888, t. 163.

PEGU, at Prome, *Wallich.* RANGOON, *Benson.*

Stem short ... *aves* imbricating at the base, 6–12 ... *Peduncle* very short stout; racem... 1–1½ in. diam., white with a few ... by white with bright purple shining terminal lobes; spur short, inflated pointing backwards.

Sect. III. CRISTATÆ. *Racemes* shortly peduncled, few-fld.; pedicels decurve... large.—

13. **V.** ...

Sert. ...

TROPICAL HIMALAYA, from Kumaon to Bhotan, *Wallich*, &c. SILHET, *J. D. H. & T. T.*

Stem 3–6 in., very stout. *Leaves* 3–5 in., rigidly coriaceous, recurved, keeled, truncately 3-toothed. *Raceme* equalling or shorter than the leaves; bracts very short broad; pedicels with ovary long, stout; flowers 1½–2 in. diam.; side lobes of lip acute truncate or toothed; midlobe as long as the sepals; spur short, obtuse. *Capsule* 2–2½ in., narrowly clavate.

14. **V. alpina**, *Lindl. Fol. Orchid.* 10; sepals and petals narrow ... obtuse or re... ithu, *Lindl. in* ... *riffith*) Luisia ...

is (as he states in Fol. Orchid.) an error. But he again errs in referring this same plant to *Vanda bicolor*. It is his *V. undulata* (*Stauropsis undulatus*, p. 27).

15. **V. pumila**, *Hook. f.*; sepals and petals narrow pale yellowish

or white, side lobes of lip rounded, midlobe broadly ovate concave obtuse pale streaked with purple, spur conical as long as the midlobe V cristata, var Lindl Fol Orchid 10

SIKKIM and BHOTAN HIMALAYA, alt 2000 ft (Ic Cathcart & in Herb Calcutt)

A smaller species than either *cristata* or *alpina*, with the lip of the latter, but furnished with a long conical spur In the Cathcart drawings the leaves are 5–6 in and sepals and petals white, in that of the Calcutta Herb the leaves are only 3 in long and the sepals and petals are yellow The latter is ticketed as from Mongpo, in Sikkim

SPECIES UNKNOWN TO ME

V BRUNNEA *Reichb f Xen Orchid* ii 139, leaves long narrowly ligulate

V STANGEANA, *Reichb f in Bot Zeit* xvi (1858) 351, allied to *V fusco-viridis* Lindl (of Java) auricles of the lip semiovate divergent blade gradually narrowed from a broad semicordate base lip slightly 2 lobed a pair of small calli before the mouth of the spur, dorsal sepal cuneate ovate about equalling the petals lateral sepals larger —Sepals and petals golden green tesselated with beautiful chestnut brown lip and column white, lip pale violet in front with a streak of red dots

cuneate oblong obtuse undulate gradually narrowed to the base pale olive green

61 SACCOLABIUM, *Blum*

62 SCHŒNORCHIS, Bl 63 UNCIFERA, *Lindl* 64 ACAMPE, *Lindl.*

flo
an
Lip
or conic cylindric spur, small lateral lobes and a small midlobe, sac or spur not septate within and without a large scale or callus within under the column (except *S longifolium*) *Column* short, broad truncate, rarely beaked, foot 0, anther 1 or imperfectly 2 celled, pollinia 2, entire or 2 partite —Species about 40 Eastern Asiatic

The following sections are, I think, natural, but are not clearly definable by words

Sect. I MICRANTHÆ *Leaves* flat terete or channelled *Flowers* small often minute, in simple or panicled racemes or spikes *Lip* various, spur long or short (See also Sect vi *Uncifera*) (Sp 1-19)

Sect. II. CALCEOLARIA *Leaves* lorate flat, flaccid *Flowers* subcorymbose on a short stout peduncle, bracts short, broad rounded *Lip* a large hemispheric sac, with truncate or short side lobes and a short triangular or reniform adnate erose or fimbriate midlobe which is warted or echinate on the disk *Column* very short, strap of globose pollinia linear (Sp 20-27)

Sect. III. ACAMPE Stem usually long and very stout *Leaves* keeled thickly coriaceous *Flowers* corymbose as in § *Calceolaria*, rarely in large spreading panicles *Lip* as in § *Calceolaria*, but with a thicker warted reniform or ovate midlobe (spur cylindric in *S ochraceum*) *Column* very short, strap of globose pollinia linear (ACAMPE, *Lindl*) (Sp 28-34)

Sect IV PLATYRHIZON *Stem* 0 or very short, roots very long, flattened *Leaves* lorate, flaccid *Flowers* racemed *Lip* very small, spur saccate or conical midlobe small reniform *Column* very short, strap of globose pollinia linear, gland large (MICROPERA, *Dalz*) (Sp 35 36)

Sect V DISTICHOPHYLLÆ *Stem* tufted very slender pendulous leafy throughout *Leaves* uniform, distichous, lanceolate *Flower* small, in very short racemes. *Lip* small, spur saccate *Column* very short, strap of pollinia slender, gland sagittate (Sp 37 38)

Sect VI SPECIOSÆ *Stem* very stout as are the long roots *Leaves* linear [illegible]

no foot to the column (Sp [illegible] 41)

Sect VII UNCIFERÆ *Stem* very short *Leaves* distichous, coriaceous *Flowers* in dense racemes *Lip* with a large funnel shaped incurved spur much longer than the sepals *Column* decurved rostellum elongate, anther long beaked, pollinia globose, seated near the geniculately inflexed apex of a very long slender strap with recurved margins, gland large, linear, or sagittate UNCIFERA, *Lindl.* (Sp 42 43)

Sect I MICRANTHÆ (See p 54)

* Stems elongate pendulous, leaves terete, filiform, or semiterete

[illegible]

EASTERN HIMALAYA, alt 3-5000 ft, Bhotan *Griffith*, Sikkim *J D H* KHASIA and JYNTEA HILLS, alt 2-4000 ft, common

Stem 6-12 in, curved, rooting at the base *Leaves* 2-4 in fleshy, $\frac{1}{8}$-$\frac{1}{6}$ in diam [illegible] flowers $\frac{1}{4}$ in [illegible] ble, blade [illegible] very short, [illegible] subsessile $\frac{1}{4}$-$\frac{1}{2}$ in long, oblong, curved

2 **S. niveum,** *Lindl Gen & Sp Orchid* 224, stem short, leaves recurved semiterete channelled notched, racemes slender panicled, sepals ovate oblong 1 nerved about equalling the ovoid obtuse spur, petals cuneately oblong truncate 1-nerved, midlobe of lip spathulate fleshy concave *Thwaites Enum* 304

CEYLON, in the Central Province, alt 3-4000 ft, *Walker, Thwaites.*

Stem stout, 1-4 in, curved *Leaves* 2-4 in, fleshy, $\frac{1}{8}$-$\frac{1}{6}$ in diam *Panicles* longer than the leaves, branches spreading, bracts minute, acute, flower $\frac{1}{12}$ in long.

white, tips of lateral sepals fleshy at the back, lip with minute rounded side lobes, column very short, anther hemispheric, strap of pollinia very short, gland very large *Capsule* ½ in, oblong —Griffith (n 872) has a form with much broader leaves, ⅓ in diam and stouter scapes

3 **S. filiforme,** *Lindl in Journ Linn Soc* iii 36 stem slender, leaves slender terete acuminate, racemes short stout simple, sepals linear, petals orbicular, shorter than the cylindric obtuse recurved spur, limb of lip ovate acute deflexed, side lobes large rounded *Walp Ann* vi 887. Sarcanthus filiformis & roseus *Wight Ic* t 1684 (*excl capsule*) 1685 Schœnorchis juncifolia *Thwaites Enum* 304 (*not of Blume*)

Malabar and Travancore on the Nilghiri hills, at Ned lawuttum and Pycara, *Wight* Pulney and Anamallay hill *Cotton, &c* Ceylon, Central Province, alt 4–6000 ft, *Walker &c*

Stem 6–10 in internodes 1–2 in *Leaves* 2–6 in, as thick as a sparrow quill or more slender *Racemes* 1½–2 in, stout sub essile, often deflexed, bracts lanceolate; flowers ¼ in long red or orange streaked with crimson, sepals 1 nerved petals with 3 nerves rugose on the back, spur of lip inflated, anther hemispheric, strap of globose pollinia short, dilated upwards gland very large *Capsule* ½ in pyriform, pedicelled —Flowers rose coloured in Wight s plant, orange with red stripes in the Ceylon plants

4 **S. perpusillum,** *Hook f Ic Plant ined* stem short curved, leaves terete recurved acute racemes erect stout flowering to the base, bracts subulate persistent, flowers minute pubescent sepals ovate oblong, petals obovate oblong obtuse, lip oblong slightly concave, tip with a fleshy acute subcordate appendage, spur short cylindric obtuse incurved

Singapore at Sungei Buloh *Ridley*

Stem 3 5 in as thick as a sparrow s quill rigid *Leaves* 1–1¼ in, subsecund *Racemes* ½–¾ in, rachis stout, flowers $\frac{1}{20}$ in diam, pedicel very short, sepals 1-nerved lateral acum nate, petals as long obtu e, glabrous 1-nerved, lip as long as the sepals, spur large, fleshy appendage at the tip of the lip didymous on the upper face —A remarkable little spec es, unlike any other

5 **S.? [illegible]** [illegible] es 2–3 in, [illegible] l clusters, [illegible] emispheric [illegible] ted on the [illegible]

[illegible] internodes [illegible] *lowers* ¼ in d m, shortly pedicelled pale green, sepals and petals subequal, spreading and [illegible]

[illegible] strap short, gland ovate —the lip is like that of sect *Calceolaria* Described from the drawing in the Calcutta Herbarium

** Stem short or long Leaves flat or channelled

† *Spur of lip longer than the sepals* (*See also* 16, S rostellatum)

6 **S. Pumilio,** *Reichb f in Walp Ann* vi 886, *in Gard Chron* 1875, ii 98, stem very short, leaves falcately oblanceolate obtuse notched or 2 fid, racemes about equalling the leaves laxly many-fld, lateral sepals broadly ovate obtuse petals oblanceolate obtuse side lobe of lip very short rounded, midlobe large flat triangular 3-nerved smooth, spur much longer than the sepals slender incurved S discolor, *Reichb f Ot Hamb*

42 S pusillum, *Lindl in Journ Linn Soc* iii 36 (*not of Blume*) Œceoclades pusilla, *Lindl in Wall Cat* 7332 *Gen & Sp Orchid* 237

SILHET, *Wallich*

Roots very many, slender, tortuous *Leaves* 2–3 by ½ in, fleshy, thin when dry *Racemes* slender, bracts ovate membranous, flowers ⅛ in broad pedicelled membranous, dorsal sepal obovate column rather long, beaked in front, anther low, strap of pyriform pollinia dilated above gland small oblong *Capsule* ¾ in shortly pedicelled, narrow, 6-ribbed —The citation of 'Herb Wight' under Wall Cat 7332 B is doubtless an error

7 **S. penangianum,** *Hook f Ic Plant ined* leaves narrowly linear lanceolate acuminate with a lateral notch raceme short very stout dense fld pubescent, sepals broadly ovate 1-nerved, not half the length of the conical angled abruptly incurved spur, petals oblong 1 nerved, limb of lip minute, disk fleshy terminal side lobes rounded

PENANG, on the Sonkey River, *Curtis* PERAK *Kurstler* (*Ic in Herb Calcutt*)

Stem flexuous, internodes ½ in *Leaves* 2½–3 by ¼ in thick, nerve strong beneath *Racemes* 1 1½ in fruiting decurved bracts subulate, flowers ⅓ in pubescent, white edged with yellow and a little pink column short strap of globose pollinia elongate, spathulate gland small *Capsules* ¼ in long oblong, sessile, crowded, reflexed

8 **S. Helferi,** *Hook f Ic Plant ined*, stem short, leaves loriform tip contracted notched, panicles shorter than the leaves sepals orbicular ovate 1 nerved shorter than the saccate broad spur, petals oblong blade of lip reniform, half embracing the spur quite entire, lateral lobes narrow erect

TENASSERIM, or ANDAMAN ISLANDS *Helfer* (Kew Distrib 5256) Moulmein, *Parish*, Mergui, *Griffith*

Stem 1–3 in *Leaves* few close set 2½–3½ by ⅓–½ in, sheaths short black *Panicle* about equalling the leaves slender, bracts minute, acute, flowers ⅒ in; dorsal sepal much smaller than the lateral, blade of lip shorter than the spur, column very short anther short broad pollinia globose, sessile on a large cuneate strap or gland

9 **S. gracile,** *Lindl Gen & Sp Orchid* 225, in *Journ Linn Soc* iii 35, stem short slender leaves elongate linear-lanceolate acuminate, racemes slender many fld longer than the leaves, sepals oblong obtuse 1 nerved, much shorter than the straight tubular acuminate spur, petals narrower oblong 1-nerved, blade of lip very small ovate acute, side lobes 0 *Thwaites Enum* 304

CEYLON, Central Province alt 3000 ft *Macrae*, &c

Stem 2–8 in, often zigzag internodes ¼–½ in *Leaves* 2½–4 by ⅓ in, straight or f lcate, narr [illegible] in, erect, bracts minute, sut [illegible] oblique, column short, anth [illegible] *Capsule* globose, ⅛ in diam, [illegible]

10 **S. brevifolium,** *Lindl Gen & Sp Orchid* 225 in *Journ Linn Soc* iii 35 stem rather stout scandent leaves short linear oblong unequally 2 lobed racemes very short few fld, sepals and petals subequal orbicular ovate 1 nerved not half as long as the conico cylindric straight obtuse spur limb of lip very minute, side lobes 0 *Thwaites Enum* 230 S virescens *Gardn mss*

CEYLON, Central Province common, *Macrae*, &c

Stem 6–10 in, internodes ¾ in or less *Leaves* 1–1½ by ⅓–½ in, fleshy, midrib obscure *Racemes* 1 in, recurved, bracts very minute; flowers ¼ in long, rose-

purple or greenish white, spur as long as the pedicel, column short, anther very broad, apiculate strap of globose pollinia short, gland as long very large 2 fid Bentham n Gen Plant in 579 errs in refering *Œc tenera* to this, it is my *Cleisostoma tenerum*

11 **S. roseum,** *Lindl Gen & Sp Orchid* 225, stem very slender, leaves fleshy flat narrowly linear unequally notched racemes very short simple, sepals ovate oblong obtuse 1 nerved, petals as large rounded 1 nerved, spur of lip longer than the sepals cylindric obtuse lip minute ovate acute, side lobes rounded *Thwaites Enum* 304 Sarcanthus Walkerianus, *Wight Ic t* 1686 (*bad*) S Walkerianum *Reichb f in Walp Ann* vi 887

Macrae, Ye

by ⅛–⅙ in *Raceme* 1–1½ in, alker, lilac in Ic. Thwaites, short slender, gland large

12 **S. flavum,** *Hook f Ic Plant ined*, stem short very stout, leaves close set teriform deeply unequally acutely 2 cleft, raceme lax fld, sepals oblong obtuse, lip small, infundibular spur much longer than the sepals with small toothed side lobes and truncate mouth

TENASSERIM; at Moulmein, *Parish*

Stem 6 in stout *Leaves* 4 5 b

between the lobes, sheaths ¼ in,

stem w th

S. fragrans, *Par & Reichf*

stem very short,

te, base sud and with an thed towards

Stem ½ in *Leaves* 5–8 by 1 in, bases closely imbricate, deeply channelled *Raceme* as long as the leaves flowers about in long

ts, lip twice aight blid, lobose, sess le the strap —

†† *Spur of lip shorter than (rarely equalling) the sepals*

in Gard Chron 1871, 938, stem scan 2 lobed, raceme simple or branched broadly ovate much longer than the obes spreading rounded midlobe nar *in Journ Linn Soc* iii 36 (*in note*) *Wall Cat* 7334, *Gen & Sp Orchid*

Cymbidium Satyrium, *Herb Ham*

BHOTAN HIMALAYA, *Lister*. ASSAM, at Goalpara, *Hamilton*. SYLHET, *Wallich* TENASSERIM, *Parish*

Stem stout, rigid, internodes ½ in *Leaves* 3–5 by ½–¾ in, fleshy, 5 nerved *Paceme* with long slender peduncle 5–6 in, laxly many-fld, bracts subulate, flowers ½ in diam, yellowish, sepals 5-nerved, petals much smaller, cuneately obovate, 3 nerved, lip yellow, mouth of spur a very narrow chink neck contracted, base

15 **S. micranthum,** *Lindl in Wall Cat* 7300, *Gen & Sp Orchid* 220, leaves lorate unequally obtusely 2 lobed, scape stout flowering to the base, racemes very many and dense fld, sepals broadly ovate obtuse 3-nerved petals oblong or lanceolate serrulate, spur of lip shorter than the sepals subtruncate, blade obovate spathulate with 2 basal calli, lateral lobes broad obtuse *Saunders' Refug Bot* t 110

TROPICAL HIMALAYA, from Garwhal and Kumaon alt 2–3000 ft, *Falconer, Duthie*, to Bhotan, *Griffith* ASSAM, SILHET and the NAGA HILLS, *Prain* TENASSERIM, *Griffith, Parish*

Stem 6–10 in curved, as thick as a goose-quill or less *Leaves* 3 5 by ¾–1 in, narrowed to the base *Raceme* equalling the leaves bracts small, broad, flowers about ⅛ in diam, 3-nerved sepals and petals violet lip rose red, column very short, anther very broad, acuminate globose pollinia strap very short broadly cordate, gland orbicular *Capsules* ½ in, subfusiform

16 **S. rostellatum,** *Hook f Ic Plant ined*, stem very short,

SIKKIM, at Darjeeling alt 7000 ft, *Gamble* (*in Herb Calcutt*)

Roots very many and long, tortuous flat, appressed to the bark *Leaves* ½–¾ in diam, nearly straight *Peduncle* with 8–10 fld raceme 2 in, slender, flowers ⅛ in long from the tip of the dorsal sepal to that of the spur, petals oblong, obtuse, smaller than the sepals column very short, rostellum subulate, pollinia large, globose, cleft

17 **S. minimiflorum,** *Hook f Ic Plant ined*, stem very short,

mouth of the sac

PERAK, *Scortechini*

Roots slender, tufted *Leaves* 1½–2 in, black when dry, thinly coriaceous, reddish beneath *Scape* with raceme 2 6 in, with a few subulate empty bracts below, flowers greenish yellow mottled about $\frac{1}{10}$ in long or broad, lip larger than the rest of the perianth, its beak like laterally compressed terminal lobe incurved over the mouth, column short, anther long beaked —A curious little plant I have had difficulty in dissecting the few available flowers, and thereby confirming a description and rude drawing by Scortechini, who mentions "a something membranous whitish which I cannot make out whether it is a rostellum or stipes" This I presume to be a recurved elongate body which appears to be attached to the base of the column

18 **S. Jerdonianum,** *Reichb f in Walp Ann* vi 866, leaves linear subacute, racemes simple or branched slender, sepals ovate 1-nerved

longer than the small saccate or subglobose spur, petals linear 1 nerved, blade of lip oblong concave subtruncate, side lobes small rounded. Taeniophyllum Jerdonianum, *Wight Ic* t 1756

MALABAR, on branches of trees, *Jerdon*

Stem 1-3 in, tufted *Leaves* 1-1½ by ⅜ in *Racemes* much longer than the leaves, bracts ovate, acuminate flowers 1/12 in long, column short, anther broad, pollinia with a short strap and large narrow gland—Described chiefly from Wight

19 **S. lanatum,** *Hook f*, stem short, leaves linear oblong broadly 2 lobed peduncle very stout longer than the leaves, spikes dense fld tomentose or woolly sepals ovate tips keeled, side lobes of lip triangular, midlobe ovate bicuspidate, spur short saccate traversed by a pubescent ridge from the base of the column to that of the midlobe Cleisostoma lanatum, *Lindl in Journ Hort Soc* iv 264, *Walp Ann* 889

TENASSERIM, at Moulmein *Parish Scott*

Stem very stout *Leaves* 3-4 by 1-1¼ in thickly coriaceous, keeled *Scape* with long appressed sheaths simple [illegible]
ovate, acuminate spreading or refle[illegible]
green, petals obovate, ciliate yell[illegible]
inner margin, ciliate, midlobe wit[illegible]
descending into the spur, mouth of [illegible]
border, column stout, recurved, [illegible]
pollinia globose, sulcate, strap long slender dilated and forked above, each arm spathulate and with the globose pollinia immersed in their concave tips gland small oblong—A remarkable plant put by Lindley into *Cleisostoma*, but I do not find the great gland in the spur under the column

Sect II CALCEOLARIA (See p 54)

The species of this section wants a thorough revision with much better material than is at my disposal

20 **S. calceolare,** *Lindl in Wall Cat* 7302, *Gen & Sp Orchid* [illegible] 1883, *Misc* 139, *in Journ* [illegible] unequally 2 lobed or -cleft, [illegible] *Griff Notul* iii 356, [illegible] 334, *Walp Ann* vi 883 [illegible] Ae leopardorum, *Wall* [illegible] Sarcochilus nepalensis, *Spr Syst Veg* iii 721 Epidendrum calceolare, *Ham mss*

TROPICAL HIMALAYA, from Garwhal to Bhotan, ASSAM, SILHET and the KHASIA HILLS TENASSERIM, *Parish* PERAK, *Carter*—DISTRIB ? JAVA

A very common plant and, if two species are not included, very variable [illegible]

21. **S. nilagiricum,** *Hook f*, leaves narrow deeply unequally 2 lobed sepals and petals each with two series of large blotches, limb of lip fimbriately erose disk smooth Vanda pulchella, *Wight Ic* t 1671

NILGHIRI HILLS, on the banks of the Kaitairy river and at Quelin, *Wight*

Stem short *Leaves* 5-10 by ¼-⅓ in, flexuous, lobes very unequal, obtuse, often

divaricate, the longer sometimes 1 in long *Flowers* ½ in diam, perianth strongly incurved *Capsule* ½–¾ in —United with *S calceolare* by Lindley (in Journ Linn Soc) but I think as different as any other of this section

22 **S. acutifolium,** *Lindl Gen & Sp Orchid* 223, *Sert Orchid Frontisp No 2 in Journ Linn Soc* iii 33 stem elongate, leaves acute or acuminate, blade of lip erose disk naked or very sparingly tubercled *Reichb f Otia Hamburg* 42, *Walp Ann* vi 883 S denticulatum, *Paxt Mag Bot* vii t 145, *Reichb f l c*, ? *Bot Mag* t 4772 Aerides umbellatum, *Wall mss*

Sikkim Himalaya, alt 3–5000 ft Khasia Mts, *Gibson*

Usually a larger plant than the small states of *S calceolare*, with longer stems (4–8 in) and larger leaves, 4–6 by ¾–1½ in broad never 2-fid, but very variable *Perianth* whole-cold and yellowish red, or more yellow or greenish and mottled with brown lip white centre yellow often speckled with red *Capsule* in Sikkim sp 3 in long —Paxton's *S denticulatum* has greenish yellow flowers speckled with brown, and the lip is described as erose Lindley refers it to *S acutifolium* The lip of the Bot Mag plant, apparently derived from the same source, is not erose, but with a broad thick white fringe of long papillæ

23 **S. intermedium,** *Griff mss ex Lindl in Journ Linn Soc* iii 33, stem rather long, leaves very narrow acuminate or 2 toothed, blade of lip fimbriate, disk smooth *Reichb f Otia Hamburg* 42 S calceolare, *Paxt Mag Bot* vi 97 —Saccolab, *Griff Notul* iii 357, *Ic Plant Asiat* t 333

Bhotan Himalaya, *Griffith* Khasia Hills, alt 3–5000 ft, *Griffith, Gibson, J D H & T T*

Perhaps a small form of *S acutifolium*, but the stem is more slender, the leaves narrower, and the flowers and capsules (¾ in) much smaller

24 **S. bellinum,** *Reichb f in Gard Chron* 1884 i 174, 187, i 145, stem rather long leaves deeply unequally cleft, bracts and flowers large, blade of lip erose disk echinate and with cushions of cilia at the base *Warner Orchid Alb* t 156, *Bot Mag* t 7142

Burma, *Boxall*

This resembles a large state of *S calceolare*, the flowers are 1–1½ in diam, bright yellow with large purple blotches

25 **S. obliquum,** *Lindl in Wall Cat* 7304, *Gen & Sp Orchid*

Burma, at Taingdong, *Wallich* ? Khasia Hills *J D H & T T.*

Leaves 6–8 by 1–2 in; flowers 1 in diam, sepals and petals narrow, whole cold, all (in Ic Wallich) pale yellow, with the lip white speckled with yellow The Khasia specimens have the shorter leaves of *bigibbum*

26 **S. bigibbum,** *Reichb f in Bot Mag* t 5766, *Otia Hamburg* 43, *stem very short, leaves oblong or obovate oblong 2 fid, bracts small,* blade of lip fimbriate, disk smooth with a large 2-lobed callus

Rangoon, *Benson, Gilbert* Perak *Scortechini*

Probably a small state of *S obliquum*, but the leaves are shorter and broader, 3–4 by 1–1½ in, and the large bracts seem to be wanting *Flowers* whole-cold., pale straw cold in a drawing by Mr Gilbert, bright yellow in Bot Mag

27 **S. acaule,** *Hook f*, stem very short, leaves unequally 2 lobed, sepals obovate, limb of lip broadly ovate acute toothed and erose, disk

thickened Cleisostoma acaulis, *Lindl Gen & Sp Orchid* 227. Vanda fimbriata, *Gardn mss*

CEYLON, *Macrae*, at Hantani, *Gardner*

Leaves 5-6 by ½-⅔ in *Peduncle* and *pedicels* very short ¼ in, stout, flowers ½ in diam, apparently very fleshy —Possibly a form of *S adagiricum* but the leaves and lip appear to be very different The specimens are very scanty and poor

Sect III. ACAMPE (See p 54)

The species of this section are very difficult of discrimination in a dried state, and the following diagnoses and citation are not very reliable, owing to imperfection of specimens and vagueness of published descriptions (See two species at the end of the genus)

* *Peduncle rather slender, flowers in large panicles Spur of lip cylindric, midlobe ovate*

28 **S. ochraceum,** *Lindl in Bot Reg* 1842 *Misc* 2 S lineolatum *Thwaites Enum* 304 Acampe dentata, *Lindl Fol Orchid* 3, *Reichb f in Gard Chron* 1872, 1752 *Walp Ann* vi 894 A Wightiana *var* longepedunculata, *Thwaites l c* 303

EASTERN TROPICAL HIMALAYA, Sikkim, *J D H* Bhotan, *Griffith* (*Kew Distrib* 5233) KHASIA MTS and TENASSERIM, *Griffith*, &c MALABAR, *Jerdon* CEYLON, *Walker*, *&c*

Stem 1 2 ft *Leaves* 7-9 by 1-1½ in *Panicle* longer or shorter than the leaves, branches distant lax-fld, flowers ⅓-½ in diam, midlobe of lip ovate, crenate, 2 auricled and with fleshy teeth at the base, spur cylindric, as long as the limb, hairy within *Capsule* 1-1½ in, fusiform —Bentham in Gen Plant iii 581, misled by a mixture of specimens of different species, errs in referring *S lineolatum* to *Cleisostoma maculosum*, it is clearly this plant

** *Peduncle very stout, simple or very sparingly branched Lip a hemispheric or conic sac, midlobe reniform*

29 **S. longifolium,** *Hook f*, leaves 6-16 in, peduncle 6-7 in, internodes long, flowers subcorymbose, midlobe of lip ovate obtuse, sac broad conical with an erect dorsal hairy plate in the cavity Acampe ? longifolia *Lindl Fol Orchid* 1 ? A multiflora, *Lindl l c* Vanda longifolia, *Lindl in Wall Cat* 7322, *Gen & Sp Orchid* 215, *in Journ Hort. Soc* vii 267, *Walp Ann* vi 872 V multiflora, *Lindl Collect* t 38

TROPICAL SIKKIM HIMALAYA (Ic in Hort Calcutt) UPPER ASSAM, *Mann* TENASSERIM, *Wallich*, &c —DISTRIB China ?

Stem very stout *Leaves* 1½-2 in broad *Peduncle* with racemes 6-7 in, as thick as a swan's quill with often a few short lateral branches, bracts annular, flowers crowded, ¾ in diam, golden yellow banded with red on both surfaces The dorsal plate in the cavity of the lip recalls *Cleisostoma*

30 **S. Wightianum,** *Hook f*, leaves 4-6 in, peduncle 1-3 in, internodes very close, midlobe of lip ovate keeled, sac rounded papillose within S papillosum, *Dalz & Gibs Bomb Fl* 264 (*excl some syn*) Acampe Wightiana, *Lindl Fol Orchid* 2 Vanda Wightiana, *Lindl mss in Wight Ic* t 1670 *Thwaites Enum* 303, *Walp Ann* vi 873 V fasciata, *Gardn mss* —*Rheede Hort, Mal* xii t 1

WESTERN GHATS, from the Concan southward CEYLON, *Gardner*, &c

Stem 12-18 in *Leaves* ⅔-1½ in broad *Scape* very stout, bracts very broadly ovate, acute, flowers ⅔-1 in diam, subcorymbose, yellow barred with crimson, not papillose *Capsule* 2-2½ in, fusiform

31 **S. præmorsum,** *Hook f*, leaves 5-7 in narrow, scape 1-2 in.

very stout, internodes short, sheaths annular, bracts semicircular, flowers papillose, midlobe of lip broadly ovate or rounded, sac rounded tubercled and pubescent at the base within Acampe excavata, *Lindl Fol Orchid* 3, *Walp Ann* vi 874 Cymbidium præmorsum, *Swartz in Nov Act Upsal* vi 75, *Willd Sp Pl* iv 103 *Roxb Fl Ind* iii 465 Epidendrum præmorsum *Roxb Cor Pl* i 34 t 43—*Rheede Hort Mal* xii t 4 Aerides undulata *Smith in Rees Cycl* p xxxix

WESTERN PENINSULA, in the Circars *Roxburgh* the Concan, *Law*

Apparently near S *Wightianum* but more slender leaves narrower lip deeply lobed, very complicate, flowers small papillose all over, ⅓–½ in diam *Capsule* 2¼ in

32 **S. papillosum,** *Lindl in Bot Reg* t 1552 (*excl syn*), *Gen & Sp Orchid* 222, stem elongate branched scandent, leaves 3 4 in, scape 1–2 in, internodes close, bracts semicircular midlobe of lip ovate, spur conical pubescent within S carinatum *Griff Notul* iii 364 Acampe papillosa *Lindl Fol Orchid* 2 *Walp Ann* vi 873 Sarcochilus præmorsus, *Spreng Syst Pl* iii 721 *fid Steudel*

BENGAL and the lower HIMALAYA MTS, from Sikkim eastwards. ASSAM, the GANGETIC DELTA, the CIRCARS and TENASSERIM

Stem 2–3 ft, as thick as a goose quill *Leaves* obliquely notched *Scape* closely scarred to the base, flowers ¾ in diam, ovary very short *Capsule* 1¼ in, fusiform —The lip is broader in Lindley s figure than in Sylhet specimens, in which they are oblong ovate

33 **S. cephalotes,** *Hook f*, stem very short, leaves 3–5 in narrow with a unilateral semicircular sinus at the tip, peduncle 1 in, midlobe of lip broadly ovate crenulate sac conic hairy within Acampe cephalotes *Lindl Fol Orchid* 3, *Walp Ann* vi 873

SILHET *H f & T*

A small species of which there are very few specimens, it appears to differ from S *papilloseum* in the short stems, longer crowded leaves and small yellow green flowers barred with purple, lip pale rose with darker spots, disk fimbriate

34 **S. congestum,** *Hook f*, stem short very stout, leaves 6–8 in, scape 1½–2 in, internodes very short, bracts broadly ovate acute, flowers crowded, limb of lip rhomboid acute angled, spur shortly conical or saccate hairy within S papillosum *Wight Ic* t 1672 (*not of Lindl*) Acampe congesta, *Lindl Fol Orchid* 3, *Walp Ann* vi 873 Vanda congesta, *Lindl in Bot Reg* 1839, *Misc* 61

Sect IV PLATYRHIZON (See p 54)

35 **S. viridiflorum,** *Lindl in Journ Linn Soc* iii 36, leaves 1–2½ in, racemes shorter than the leaves subcorymbose spur acute glabrous within parallel to the blade of the lip *Dalz & Gibs Bomb Fl* 263, *Walp Ann* vi 885 Micropera viridiflora, *Dalz in Hook Journ Bot* iii (1851) 282

The SOUTHERN CONCAN, in the Western Ghats, *Law*, *Dalzell* CEYLON, near Kandy (*Ic in Herb Kew*)

Leaves ⅓–½ in broad *Raceme* 3–5 fl, bracts short, broad, obtuse; flowers

⅓–½ in diam, greenish white lip cloud l with ro e colour blade situated at the mouth of the spur which it embraces broadly deflexed flabelliform membranous outer margins crenulate or trifid, side lobes free rounded, spur very short, conical, incurved

36 **S. maculatum,** *Hook f* longer than the leaves laxly many pera maculata *Dal- in Hook Jou Bomb Fl* 263, *Lindl in Journ* latus, *Benth in Gen Plant* iii 575

The SOUTHERN CONCAN and CANARA on the Western Ghats, *Dalzell Stocks, Ritchie*, &c

Leaves 1–2 in, broad, l near oblong to cuneately oblong 2-lobed *Raceme* 8–12 in very shortly peduncled bracts short, broad rachis stout, flowers ½ in white and which it t and re- *idiflorum*, and not a *Sarcochilus*, to which Bentham has referred it

Sect V DISTICHA (See p 54)

37 **S. distichum,** *Lindl in Journ Linn Soc* iii 36, leaves 1 in

SIKKIM HIMALAYA alt 6–8000 ft *Griffith s Collectors* KHASIA HILLS, alt 5–6000 ft, *J D H & T T* MUNNIPORE, alt 6900 ft, *Watt*

Stems 4–8 in, filiform *Leaves* very fleshy *Peduncle* rarely longer than the leaves, flowers racemose, ⅓–½ in diam, bracts small; sepals and petals green or yellowish spotted with purple, side lobes of lip 0, column very short *Capsule* ¾ in, fusiform

only, deeply grooved *Leaves* ⅓–½ in broad, strict *Flowers* ¼ in diam, pale green, sepals thin, nerves 3 faint, petals 1 nerved, column stout, midlobe of lip cymbiform smooth *Column* short, anther membranous, almost flat, acuminate, rostellum projected, styliform, strap of small reniform pollinia broad, with a dilated subreniform apex, gland small

Sect VI SPECIOSÆ (See p 54)

39 **S. ampullaceum,** *Lindl in Wall Cat* 7307, *Sert Orchid* t. 17, *in Journ Linn Soc* iii 35 (*excl syn*), leaves suberect acutely 2 fid or truncate and toothed, raceme subsessile, shorter than the leaves spur straight *Paxt Mag Bot* xiii t 49, *Bot Mag* t 5595, *Warne Orchid Alb* t 191 Ærides ampullaceum *Roxb Fl Ind* iii 476

TROPICAL HIMALAYA, alt 1–3000 ft, from Nepal eastwards SILHET, MUNNIPORE, BURMA, and TENASSERIM

Stem short, stout *Leaves* 2–6 in, deeply channelled *Racemes* shorter than the leaves, cylindric, bracts minute, flowers ¾ in diam, rose red, sepals and petals broadly obovate, widely spreading, spur longer than the blade of the lip.

Capsule 1 in, subclavate, angles acute pedicel ½ in —Lindley in Journ Linn Soc by oversight probably, refers his *S rubrum* to this instead of to *curvifolium*

40 **S. curvifolium,** *Lindl Gen & Sp Orchid* 222, leaves strongly recurved very narrow, racemes much shorter than the leaves spur straight *Lindl Gen & Sp Orchid* 222, *Ill Hortic* xii t 403, *Warner Orchid Alb.* t 107, *Puydt Orchid* t 38 S rubrum, *Lindl in Wall Cat* 7310, *Gen & Sp Orchid* 222 S miniatum, *Hook Bot Mag* t 5326 (*not of Lindl*)

ASSAM, *Ic in Hort Calcutt* BURMA, *Wallich, Griffith* &c —DISTRIB Java.

Very closely allied to *S ampullaceum*, but the leaves are twice as long, much narrowed and strongly recurved, the flowers more scarlet with a golden lip —The strap of the pollen is figured in Bot Mag as broadly triangular, it should be very slender Lindley's habitat of Ceylon is no doubt an error, or referable to a cultivated specimen, or an *Aerides* may have been intended

41 **S. trichromum,** *Reichb f in Hamb Gartenzeit*, 1859 51, *Xen Orchid* 119, t 139 leaves spreading obtusely 2 lobed, racemes much shorter than the leaves flowers subsecund, spur incurved S pallens, *Lindl* (*not Cathcart*) *in Journ Linn Soc* iii 35

SIKKIM HIMALAYA (*Ic Cathcart*) BHOTAN and ASSAM (*Ic in Herb Calcutt*)

Stem 1–3 ft *Leaves* ¾–1 in broad *Racemes* 3–5 in, lax fld, shortly peduncled, pedicel with ovary ¾ in sigmoid, sepals linear-oblong, acute and broader shorter petals yellowish-white with a rose-cold midrib, lip yellowish or rose cold, speckled with pink, spur ⅓–½ in long, horn-like, limb short, acute, with a flattened hooked callus at the throat

Sect VI UNCIFERA (See p 55)

42 **S. obtusifolium,** *Hook f Ic Plant ined*, leaves broadly lorate 2 lobed, raceme elongate lip cymbiform subacute or bifid, spur incurved upon the side of the lip, tip thickened Uncifera obtusifolia, *Lindl in Journ Linn Soc* iii 40

SIKKIM HIMALAYA alt 5000 ft *Clarke* BHOTAN, in the Gheet Valley, *Lister* KHASIA HILLS, Churra, alt 4000 ft, *J D H & T T*

Stem 2–4 in, as thick as a goose-quill, roots very many and long *Leaves* flat, 4–6 by ¾–1 in, very thick, lobes obtuse *Peduncle* with *raceme* very stout, 2–3 in; bracts rather large, ovate, persistent, at length reflexed, pedicel with ovary ½ in, flowers ¼–⅓ in diam, pale lemon coloured, at first greenish, limb of lip shorter than the obovate oblong obscurely nerved sepals, tip of lip thickened, side lobes truncate, column very short, rostellum beaked, anther long-beaked, pollinia small on the face of the refracted end of the elongate spathulate strap, the margins of which are recurved, gland very long

43 **S. acuminatum,** *Hook f, Ic Plant ined*, leaves linear- or oblong-lanceolate obliquely acuminate raceme short, lip cymbiform obtuse, spur arcuate, tip acute Uncifera acuminata, *Lindl in Journ Linn Soc* iii. 40

SIKKIM HIMALAYA, alt 6–7000 ft, *Gamble* KHASIA HILLS, *Griffith* (*Kew Distrib* 5257) &c

A much more slender plant than *S obtusifolium*, with narrower shorter leaves and shorter racemes, a much less curved spur, flowers about the same size and colour,

but spur not so long or so much incurved, gland of the pollinia smaller *Capsule* ¾-1 in., narrowly fusiform, shortly pedicelled

DOUBTFUL AND IMPERFECTLY KNOWN SPECIES

S CLAVATUM, *Lindl Gen & Sp Orchid* 223 (Epidendrum clavatum, *Retz*

ovate oblong acute obliquely 2 toothed, corymbs subumbellate sepals and petals in curved linear oblong green without blood red within, lip white dotted with blood red, limb dilated subcordate toothed —Nepal, *Hamilton* —(Probably *S calceolare*)

65 SARCANTHUS, *Lindl*

Characters of *Saccolabium*, but spur with a dorsal usually 2 lobed callus or an erect plate within, inserted under the column and with the cavity more or less divided by a vertical septum —Species about 20, Tropical Asiatic

But for the inconvenience attending the substitution of a new generic name for the numerous species of this genus, I should unhesitatingly unite it to *Cleisostoma*, and both to *Saccolabium* The only character whereby its species can be distinguished is the more or less septate cavity of the spur, often a very obscure one, and almost inappreciable when the septum is reduced to a mere ridge

* Leaves elongate, filiform

61, leaves 8-10 in, maller and narrower, acute incurved, mid *Bot Mag* t 4639, *Jard Fleur* 266

SIKKIM HIMALAYA *Griffith's Collector* KHASIA HILLS *Lobb* TENASSERIM, *Parish*

Stem pendulous as thick as a duck's quill, terete *Leaves* distant, ⅛ in diam, obtuse *Racemes* 6-10 in, curved bracts minute, ovate, pedicels very short,

2 **S. Williamsoni,** *Reichb f in Hamb Gartenzeit* 1865, 333, *in Gard Chron* 1865, 674, leaves 4–5 in, racemes long laxly many fld, sepals ovate oblong, petals smaller oblong, side lobes of lip erect oblong obtuse subfalcate, midlobe incurved fleshy thickly clawed acuminate, spur globose

TENASSERIM, at Moulmein, *Parish* ANDAMAN ISLANDS, *Berkeley*

Stem nearly as thick as a goose quill *Leaves* ⅓ in diam, curved, obtuse ... lowers ⅛ in ... e of the lip ... ollinia very

3 **S. appendiculatus,** *Hook f*, leaves 3 in, racemes short few

** Leaves flat or channelled

† *Stem elongate, scandent or pendulous*

4 **S. secundus,** *Griff Notul* iii 362, *Ic Pl Asiat* t 336, stem slender elongate, leaves 4–7 in narrowly linear lanceolate acuminate, racemes slender, flowers subsecund, sepals oblong obtuse, petals smaller, side lobes of lip tooth like midlobe small ovate acute concave, spur conico-infundibular obtuse gibbous dorsally Micropera pallida, *Lindl in Wall Cat* 7321 (*in part*), (*not of Gen & Sp Orchid*)

SILHET, *Wallich* UPPER ASSAM *Griffith*

Leaves ½–⅓ in broad, rigid 5 nerved sheaths ¾–1 in, deeply grooved when dry *Racemes* shorter than the leaves peduncle and rachis slender, bracts minute, pedicel with ovary ¼ in, flowers ⅓ in diam, sepals and petals red with white or

S *oxyphyllus*, of Wallich's mss, and that Lindley inadvertently transferred that name to No 16

5 **S. peninsularis,** *Dalz in Hook Kew Journ* iii (1857), 243,

The DECCAN PENINSULA; on the Ghats from the Concan to Travancore CEYLON; in the Saffragam district

Stem 10–12 in, as thick as a duck's quill, flexuous, pendulous *Leaves* uniform, 6–8 by ½–¾ in, rigid, strict or curved, 3–5 nerved, acuminate, tip obtuse, sheaths ribbed *Racemes* slender, bracts minute, flowers ½ in diam, greenish or yellow with pink margins and a violet lip, sepals and petals rather spreading; spur more or less perfectly 2 celled, dorsal callus small, column short, anther beaked, pollinia didymous, strap slender dilated upwards, gland small *Capsule* ¾–⅞ in, deflexed, narrowly oblong

6 **S. insectifer,** *Reichb f in Bot Zeit* 1857, 159, leaves many ½ by ⅓ in oblong amplexicaul, spikes very short stout few fld, sepals ovate-oblong obtuse, petals oblong, side lobes of lip rounded, midlobe large triangular ovate fleshy, spur short broadly conical

BEHAR; at Burkutta, *J D H* CACHAR, *Mann* CHITTAGONG (*Ic in Hort Calcutt*) TENASSERIM *Parish*

Stem a foot and upwards, robust, scandent, thicker than a goose quill *Leaves* subimbricate, obliquely obtusely 2 lobed with sometimes an intermediate apiculus, thickly coriaceous *Spikes* ½ in, sessile, bracts small, deciduous, flowers ½ in diam, greenish-yellow striped with red-brown; lip white and pink or purple, midlobe acute or acuminate, spur semiseptate mouth with a pubescent ridge, dorsal callus large, column very short stout, tip reclinate and with uncinate recurved arms; anther truncate, pollinia globose didymous, strap short very broad, gland transverse

7 **S. Scortechinii,** *Hook f*, leaves 3–5 by 1¼ in subpetioled [illegible] qualling the leaves very stout [illegible] broad, side lobes of lip ob- [illegible] than the sepals conical obtuse curved

PERAK, *Scortechini*, on rocks, *Wray*

Stem elongate, robust, as thick as a goose quill *Leaves* very thick *Spikes* 2–6 in, flowers ½ in diam, sepals and petals lurid purple with green midrib and margins, lip ½ in, yellowish, spur 2 celled, dorsal callus large, column short, anther obtusely beaked, pollinia 4, broadly oblong, strap linear *Capsules* 1 in, linear-oblong, deflexed —Described from fruiting specimens and a drawing by Scortechini.

8 **S. pallidus,** *Lindl in Bot Reg* 1840, *Misc* 78, *in Journ Linn Soc* iii 39, leaves 10–14 in lorate flat panicle very large copiously branched laxly many fld, sepals and smaller petals oblong obtuse, side [illegible] l incurved ovate acute [illegible] er, *Reichb f in Walp* [illegible] Saccolabium racemiferum, *Wall mss*

EAST NEPAL, alt 4000 ft, *J D H* BHOTAN and the KHASIA HILLS, alt. 4–6000 ft, *Wallich, &c* BURMA, *Berkeley.*

Stem as thick as the thumb roots very stout *Leaves* very coriaceous, 2 in broad, deeply obtusely 2 lobed *Panicle* with the stout peduncle 2–3 ft, branches long, slender, bracts at the forks ovate lanceolate, floral subulate, persistent, pedicel with ovary ½ in, flowers ½ in diam, sepals and petals dark purple edged with yellow, lip white, spur thick walled about as long as the sepals [illegible] longitudinally, dorsal callus [illegible] anther broad acute, pollin[illegible] ¾ in, ellipsoid or clavate —T[illegible] capsule

†† *Stem short or 0*

9 **S erinaceus,** *Reichb f in Bot Zeit* 1861 298 leaves linear oblong subacute channelled racemes longer than the leaves pendulous laxly many fld hirsute sepals and smaller petals oblong obovate white side lobes of l p broad midlobe ovate oblong o tuse spur shorter than the sepals saccate *Bot Mag t* 5630 S Stowellianus *Batem mss*

ved
v th
the
beak
decurved base broad anther long beaked str p of pollin a very slender gland m nute

10 **S laxus,** *Re chb f in Bot Zeit* 1886 378 *in Saunders Refug Bot* t 109 leaves very short broad fleshy raceme 6–8 in sepals broadly oblong obtuse petals obovate oblong side lobes of l p ere t midlobe very short obtuse concave spur broadly con cal obtuse

TENASSERIM at Moulne n *Gr ffith Par sh*

Stem 0 *Leaves* 2½ 3 by 1 1¼ i l near oblong obtusely 2 lobed clo ded w th purple beneatl *Peduncle* slender br n he l at tl e bas very lax fld bracts m ute ped cel w tl ovary l or zo tal ⅗ n lo flo vers yellow res p nate spur w tl a colu n slender hew, tl an n the other and tl e raceme mucl l nger A dra v ng of a flower of tl s spec es is in Herb I ndl marked Ind a G ffit) I o ld g s Tl e dge w tl the spur l ardly a nounts to a sep tum and the spec es is therefore interme l ate between *Sarcanthus* and *Cleisostoma*

11 **S Parishii,** *Hook Bot Mag t* 5217 leaves 4–6 in lorate keeled unequally obtusely 2 fid racemes or panicles elongate many and lax fld sepals ovate obtuse petals smaller narrower oblong s de lobes of l p rounded m dlobe broadly ovate stra ght or recurved spur longer than the sepals narrowly conical curved

TENASSERIM at Moulm e n *Parish*

Ste n 1 2 in i *Racemes* 6–16 n sepals and petals large column sh below tl e t p of gland m nute

12 **S lorifolius,** *Par sh mss* leaves very th ck curved linear channelled keeled obtusely notcl ed scape flexuous and rachis of pan cled den e fld sp kes stout bracts reflexe l lateral sepals broadly obovate petals more oblong obtuse s de lobes of l p su ulate midlobe ovate concave, spur longer than the sepals *Hook f Ic Plant ined*

TENASSERIM at Moul e n *Par sh*

Stem 3 4 i stout f v lea ed *Leaves* 4– by ½–¾ n sheath very short *Peduncle* 4 n green sl eatl s obtu e sp kes 3 4 in bra s o ate subulate sepals and petals yellow w th red; spur wl te ha t 2 elle l y ver cal l nella dors l ca lus didymous column short; anther short broad poll n a d dymous strap not long

gland ovate —Described from an excellent drawing by Parish Habit, spike and bracts of *Cleisostoma spicatum*, but the flowers are smaller, yellow, and the spur distinctly septate within

13 **S. oxyphyllus,** *Wall ex Lindl in Bot Reg* 1840, *Misc* 58, leaves 6-12 by ½-¾ in rigid acuminate, racemes short dense fld, sepals oblong obtuse petals smaller obovate oblong, side lobes of lip acuminate, midlobe small ovate incurved spur much longer than the sepals subcylindric obtuse ? Cleisostoma subulatum *Blume Bijd* 362 Angræcum pugioniforme, *Klotzsch in Cat Sem Hort Berol*

TENASSERIM, at Moulmein, *Parish*

Stem

Raceme 4

disk and

var of tl

misapplic

Wallich

SPECIES UNKNOWN TO ME

S ARIETINUS, *Reichb f in Gard Chron* 1869, 416, stem 5 in leaves 3 in

leaves

ing *S*

paniculatus sepals green, lip purple spotted sepals ovate apiculate, petals spur curved with a longitudinal septum, side lobes semi ovate involute auricled at the isthmus and at the base midlobe sessile triangular —Burma, *Hort Soc*

S CHRYSOMELAS *Reichb f in Gard Chron*

deucy, *Benson* (*Hort Veitch*)

S MIRABILIS *Reichb f in Gard Chron* 1878 ii 300; leaves 5½ by ½ in ligulate

Parishii, with even more remarkable pollinia [The strap of the stipitate pollinia must resemble that of *Saccolab* sect. *Uncifera*, J D H]

CLEISOSTOMA, *Blume*

Differs from *Sarcanthus* only in the spur not being septate, and from *Saccolabium* in having a dorsal scale or callus within the spur beneath the column —Species (known) probably 15 or 20

dried specimens that I hesitate to adopt it

* *Stem more or less elongate Peduncle stout, usually longer than the leaves branched, erect, flowers in short spikes or racemes terminating the branches*, (*as in* Sarcanthus pallidus)

1 **C latifolium,** *Lindl in Bot Reg* 1840 *Misc* 60, stem very stout, leaves $2\frac{1}{2}$–9 by $1\frac{1}{2}$–2 in , from oblong to lorate peduncle very stout, side lobes of lip short truncate midlobe reniformly ovate carunculed towards the base, spur saccate *Walp Ann* vi 889 C fuscum, *Lindl in Journ Hort Soc* 1850, 80 *Walp l c*

PERAK *Wray*, (*Ic Scortechini*) SINGAPORE and MALACCA, *Griffith* (*Kew Distrib* 9235) *Maingay* (K d 1647)

Stem 6–10 in as thick as the middle finger *Leaves* thickly coriaceous flat obtusely broadly 2 lobed, base narrowed *Peduncle* 12–18 in rather flexuous, sheaths annular branches 1 2 in rachis of spikes very stout bracts minute broad flowers $\frac{1}{8}$ in d
spotted with red brow
column very short
pollinia linear, gland
there is no specimen
cultivated by Loddiges and agrees in characters with *C fuscum* of which Lindley himself says it is probably only a form of *lat folium*

2 **C. andamanicum,** *Hook f*, leaves 4–6 by $\frac{1}{2}$–$\frac{3}{4}$ in lorate, peduncle equalling or exceeding the leaves, side lobes of lip short truncate, midlobe very short reniform, spur cylindric

SOUTH ANDAMAN ISLANDS *Kurz*

3 **C. maculosum,** *Lindl Gen & Sp Orchid* 227 *in Bot Reg* 1840 *Misc* 37 leaves 6–7 by $\frac{2}{3}$–$\frac{3}{4}$ in narrowly lorate peduncle stout shorter or about equalling the leaves, side lobes of lip short truncate, mid lobe very short ovate papillose, spur saccate *Walp Ann* vi 888 C galeatum *Thwaites Enum* 305 Saccolabium galeatum *Gardn mss*

CEYLON, in the Central Province, *Macrae* &c
Stem as thick as a swan's quill *Leaves* coriaceous, obtusely unequally 2 lobed *Peduncle* with annular sheaths, bracts short, broad, flowers ½ in diam, yellow

4 **C. crassifolium,** *Lindl in Part Fl Gard* iii 125 t 99, leaves
8–
wi
m
39

TENASSERIM? (*Hort Veitch*)
Stem as thick as the thumb *Leaves* recurved, very thick, channelled above

** *Stem short Peduncle slender, flowers scattered on the slender branches of the panicle*

5 **C. ramosum,** *Hook f*, stem short, leaves loriform obliquely

Wall mss

SIKKIM HIMALAYA, in hot valleys *J D H* LOWER BENGAL and the Sunderbunds, *Wallich*, *Clarke* BURMA, on the Attran River *Wallich*, Moulmein, *Parish*
Stem 1–3 in *Leaves* 3–5 by ½–¾ in *Panicle* erect, bracts minute, flowers

Wallich's specimens from Burma have very narrow leaves

*** *Stem usually elongate Peduncle slender or stout rarely branched, usually shorter than the leaves*

6 **C. spicatum,** *Lindl in Bot Reg* 1847, *under* t 32, leaves 4–8 by 1–2 in, spike stout simple dense fld, bracts ovate-subulate deflexed side lobes of lip broad
above the inflated
f in Trans Linn
Cat 7311, *Gen &*
densiflorum *Wall mss*.

TENASSERIM; at Moulmein, *Parish* PENANG, *Wallich*, *Curtis* —DISTRIB Borneo
Stem as thick as the middle finger in Penang, more slender in Moulmein *Leaves* oblong or linear oblong, broadly unequally 2 lobed *Spike* decurved or pendulous, flowers ½ in diam, glabrous or subfurfuraceous; sepals and petals broad,

dull red with a pale central band, lip yellowish flushed with red, midlobe incurved, spur sometimes transversely septate towards the base, dorsal callus forked, column very short, rostellum short, anther beaked, strap of globose pollinia slender, dilated upwards, gland small.—The spur is like that of *Saccolab buccosum*

7. **C. tenerum,** *Hook f*, stem scandent, leaves 1–2 in oblong,

Œonia ? alata *A Rich in Ann Sc Nat Ser* 3, xv 67, t 7. Saccolabium ? tenerum, *Lindl in Journ Linn Soc* iii 36

NILGHIRI HILLS, in woods near Neddubetta, *Perrottet* CEYLON, in the Central Province, alt 3–5000 ft, *Macrae* &c

Stem 1–2 ft, as thick as a duck's quill *Leaves* scattered, fleshy, tip rounded or notched. *Peduncle* ½–¾ in, woolly, basal sheaths cupular, bracts cymbiform, flowers ¾ in diam, fleshy, yellow or greenish, nerves red, sepals and petals oblanceolate obtuse, lateral sepals decurved, midlobe of lip white, dorsal callus fleshy, column rather long, anther short broad acute, strap of globose pollinia slender, gland small *Capsule* 1 in, turgid, elliptic-oblong or pyriform —Erroneously referred to *Saccolab brevifolium* in Gen Plant (iii 579) I have seen no Nilghiri specimen.

8 **C. bipunctatum,** *Hook f*, stem slender scandent, leaves 4–6 by ½–¾ in subacute, peduncle very short, 1–2 fld side lobes of lip small subfalcate, midlobe large ovate-lanceolate, spur very small incurved obtuse, saccate Saccolabium bipunctatum, *Par & Reichb f in Trans Linn Soc* xxx 145

TENASSERIM, at Moulmein, *Parish*

Stem about as thick as a duck's quill *Leaves* lorate, laterally notched towards the tip, costa stout beneath *Flowers* about ¼ in diam yellow and purplish; bracts obscure, sepals oblong lanceolate, acute 3 nerved, and linear-oblong 1-nerved petals falcate, midlobe of lip longer than the sepals, white, 3-nerved with a basal callus, dorsal scale membranous toothed, column very short, anther short, very broad, strap of subglobose pollinia linear, gland small —I have seen only a very small specimen Reichenbach, though describing the scale in the spur, places this in *Saccolabium*

9 **C. brevipes,** *Hook f*, stem elongate, leaves 4 in distichous [illegible] sessile dense fld, rachis [illegible] ls and petals subsimilar [illegible] bands, lip pale yellow, [illegible] with a membranous 2-awned tip, disk thickened, spur a short sac tip rounded

SIKKIM HIMALAYA, (*Ic in Hort Calcutt*), alt 5000 ft *Gamble*. ASSAM, (*Hort N. Company*)

Stems tufted, 8–12 in, as thick as a goose quill, internodes ½–¾ in, rugulose. *Leaves* erecto patent, sessile, ¾ in diam, flat, hard, tip mucronate *Spike* 1–1½ in, basal sheaths short, annular, and bracts brown, ovary ¼ in, green striped with dull purple, sac of lip oblong, thickened disk extending backward to meet the thick callus at the base of the column, thus closing the orifice of the sac; column short, stout, pollinia subquadrate, strap compressed, gland large 2-partite *Capsule* 1–1½ in, fusiform, terete, fleshy, striate —Described from fresh cultivated specimens sent to Kew.

**** *Stem very short Leaves subradical Peduncle and raceme or spike much shorter than the leaves*

10 **C. undulatum,** *Reichb f in Flora* 1872 274, leaves 4–8 by ¾–1¼ in lorate narrowed at both ends undulate, raceme many fld, sepals oblong side lobes of lip orbicular, midlobe suborbicular caruncled obscurely 3-lobed, spur short globose Saccolabium undulatum, *Lindl in Wall Cat* 7301, *Gen & Sp Orchid* 222

SILHET,
Stem 1-
sheath ver
minute flc

11 **C. uteriferum,** *Hook f*, stemless, leaves 6–8 by 1¼ in lorate tip broad rounded or retuse margins undulate, spike stoutly peduncled shorter than the leaves dense fld, sepals obovate oblong undulate tip rounded, petals smaller and narrower, side lobes of lip truncate, midlobe very small ovate fleshy, spur a large inflated subglobose sac sulcate in front, neck contracted

PERAK, *Kunstler* (*Hort Bot Calc*)
Leaves flat, base hardly contracted *Spike* with peduncle 3 in, rachis very stout, strict, bracts minute, ovary very short, $\frac{1}{12}$ in, flowers ½ in diam, thick,

contracted apex of a rather broad lanceolate strap gland oblong —Near *C undulatum* and *Wendlandorum* but with a much larger inflated spur, smaller midlobe of lip, and broad strap of the pollinia Described from an analysis of dried flowers and a fine drawing in the Calcutta Herbarium

12 **C. Wendlandorum,** *Reichb f in Otto & Dietr Allgemein*
lorate, raceme simple
narrower, side lobes
eshy, spur short in
Blume) Pomatocalpa
& Dietr Allgemein

CACHAR; *Keenan* TENASSERIM, *Parish* ANDAMAN ISLANDS *Berkeley*

and son

ASSAM, *Mann* SIKKIM? (*Ic in Herb Calcutt*)
I have seen but one specimen; it is as small as *C undulatum*, from which it

long gland small

14 **C decipiens,** *Lindl in Bot Reg* 1884 *Misc* 11, leaves 8–10 by 1 in thick purple dotted beneath, peduncle simple or branched, spike
g ovate, lip broader than long
losum, *Thwaites Enum* 304 (C
Trimen in Journ Bot 1885,

resents the stem 1½
lobed sheaths ½ in
ing peduncle stout,
speckled with purple, with the dense fld spike 2 in, lengthening to 6 in in fruit, bracts minute, subulate, flowers ⅛ in diam, yellowish more or less suffused with red *Capsule* sessile ¾ in linear oblong —The specimen in Lindley's herbarium (from Hort Loddiges) consists of an imperfect leaf 4 by ⅔ in and a few inches of a

apiculate tip —Trimen rightly suspects his

15 **C. bicuspidatum,** *Hook f* leaves 3–4 by ½–1 in acutely 2 fid, raceme lax fld much shorter than the leaves, sepals orbicular obovate obtuse, petals oblong obovate, side lobes of lip plicate truncate, midlobe very stout ovate acute incurved, spur cylindric longer than the sepals obtuse

SIKKIM HIMALAYA near Darjeeling, *Anderson* (*in Herb Calcutt*) KHASIA HILLS, alt 2000 ft *Mann* TENASSERIM, *Parish* (*Ic in Hort Calcutt*)

recurved, gland minute

SPECIES UNKNOWN TO ME

C DISCOLOR, *Lindl in Bot Reg* 1845, *Misc* 59, leaves oblong channelled obliquely trunc
sepals orbicular
t nge, lip 3 fid,
dorsal tooth unc
India (*Hort Loddiges*) In Lindley's fragment the leaf is 3½ by nearly 1 in the

C LORATUM, *Reichb f in Flora*, 1872, 273, stem short, leaves cuneately lorate obliquely acuminate, racemes stout strict, flowers small, bracts small triangular persistent, sepals and petals ligulate obtusely acute, side lobes of lip transverse retuse with a minute callus at each internal angle, spur short hemispheric, scale under column sharply 2-fid to the middle, limb ovate obtusely acute —ASSAM

ECHIOGLOSSUM STRIATUM, *Reichb f in Gard Chron* 1879 390, stem erect

67 ORNITHOCHILUS, *Wall*

Epiphytes *Stem* very short, pseudobulb 0 *Leaves* few, broad, flat *Sepals* spread *Lip* much larger clawed inflexed mouth of the short incurved spur, which is distant from the base *Column* short, foot 0, rostellum forcipate, anther low 2 celled, pollinia 2, subglobose or oblong, grooved, strap obcuneate —Species 1 or 2, Indian and Chinese

O. fuscus, ... *Sp Orchid* 242 O cublepharum, Aerides difforme *Wall in Lindl* Reichb f in *Gard Chron* 1865 698, ... *Ann* vi 899, A Hystrix *Lindl* ...

TROPICAL HIMALAYA, from Garwhal? *Falconer*, to SIKKIM, and the KHASIA HILLS, alt 4 5000 ft TENASSERIM, at Moulmein, *Parish* —DISTRIB China

Stem ¼–½ in, 2–3 leaved *Leaves* 3–7 by 1–1½ in ... acute, many nerved, base narrowed *Racemes* lax fld; bracts small, subulate, flowers ¼ streaked with red, side lobes of lip striped with red, its lobules reflexed, the mid-one entire pedicelled

68 TÆNIOPHYLLUM, *Blume*

Small stemless epiphytes, leafless when flowering, roots flattened, pseudobulbs 0 *Leaves* linear or few or 0 *Peduncle* very short filiform, simple, flowers very minute, spicate *Sepals* and *petals* subequal, free or connate at the base *Lip* sessile, saccate or spurred, side lobes short, broad, midlobe small fleshy *Column* short, broad foot 0, anther 2 celled, pollinia 4, in superposed pairs, strap linear, gland small —Species about 6 Indian, Malayan, Australian and Pacific

There are several Perak plants in Scortechini collections that are probably *Tæniophylla*; but the species are obscure, minute, and very imperfectly known, and there are no doubt many to be discovered.

1 **T. Alwisii,** *Lindl in Journ Linn Soc* iii 42, peduncle glabrous, sepals and petals connate, lip cymbiform. *Thwaites Enum* 305 *Reichb f Xen. Orchid* 67, t. 116

CEYLON; in the Ambagamowa district, *De Alwis*

Roots fleshy *Peduncle* ¼ in, bracts keeled, flowers most minute, pale green, sepals, petals and lip connate into an acutely 6-toothed perianth; margins of lip free, column short; anther square, sub 4-celled, pollinia 4, pyriform, sessile on the gland — Descript from Thwaites

2 **T. scaberulum,** *Hook f*, peduncle ½ in scaberulous, sepals petals and lip connate at the base, lip deeply saccate with a minute incurved midlobe.

TRAVANCORE, on teak branches, at Cottayam, *Johnson*

Roots about $\frac{1}{15}$ in diam, compressed *Peduncle* 2 3 fl, bracts broad, flowers sessile, $\frac{1}{12}$ in diam, sepals and petals oblong lanceolate obtuse, fleshy, sac or spur nearly as long as the limb of the lip, lobes rounded, column very short, anther truncate in front, pollinia pyriform *Capsule* (young), ¼ in, slender, curved, scaberulous.

3 **T. serrula,** *Hook f*, leafless, spike sessile many fld appearing serrulate from the number and regularity of the very minute subdistichous bracts, sepals and petals free or nearly so, lip cymbiform, side lobes low rounded, midlobe very short thick, spur scrotiform

PERAK, at Larut, *King's Collector*

Roots stout, ⅛ in diam *Spikes* ½ 1 in, bracts concave, obtuse; flowers about ¼ in diam, reddish yellow, sepals lanceolate obtuse and narrower petals with one thick nerve, side lobes of lip incurved, column very short, papillose *Capsule* ¾-1¼ in, trigonous

69 MICROSACCUS, *Blume*

Small densely tufted epiphytes, stems densely leafy *Leaves* distichous, narrow or scalpelliform fleshy *Flowers* minute, subsessile or very shortly racemose *Sepals* and *petals* subequal widely spreading *Lip* n base broadly saccate, side lobes *Column* very short, truncate, anther or globose, sessile on the slender *Capsule* small —Species 3 or 4, Malayan

1 **M. javensis,** *Blume Bijdr* 367 leaves equitant scalpelliform, flowers subsolitary *Lindl Gen & Sp Orchid* 219 Saccolabium Griffithii, *Par & Reichb f in Trans Linn Soc* xxx 145

TENASSERIM, at Mergui, *Griffith* (*Kew Distrib* 5214), *Helfer* (*Kew Distrib* 5334) *Parish* PERAK, *Scortechini* —DISTRIB Malay Islands Cambodia

Stems 2–4 in, curved, ¼ in diam across the leaves *Leaves* broad y ovate obtuse, somewhat recurved wrinkled when d ealed by the leaves, cellular, white, bracts petals rather narrower, lip obtusely 3-lob Description of flower from a drawing by no authentic Javan specimen, but the Indian plant agrees well with Blume's description

2 **M. virens,** *Hook f* leaves linear oblong trigonous flowers in very short racemes *Adenoncos virens* *Blume Bijdr* 381, *Lindl Gen & Sp Orchid* 235

PERAK, *Scortechini* —DISTRIB Java, Borneo

Stems 4–8 in, very stout, strongly incurved *Leaves* 1–1½ by ¼ in, very thick and fleshy, subacute *Racemes* much shorter than the leaves, 3–6-fld, bracts distichous, ovate, acute, very coriaceous and persistent, flowers coriaceous, about ¼ in

Indian

70 DIPLOCENTRUM, Lindl

Epiphytes, stems short leafy, pseudobulbs 0 *Leaves* distichous, ... *Peduncle* lateral, often branched, ... *Sepals* free, connivent sub ... the dorsal sepal. *Lip* sessile, joined on the base of the column spreading, entire, shortly 2 spurred, disk fleshy *Column* very short, 2 auricled, truncate, anther 2 celled, pollinia 2, ovoid, sulcate or 2 partite, attached by a broad strap to a broad gland —Species 2–3, Indian

1 **D. recurvum.** ... t 1522, *in Wall Cat* 7331, *Gen &* ... ar, panicle long peduncled branche ... *J D* longifolium, *Wight I c* t 1681

NILGHERY and TRAVANCORE, *Wight*, &c CEYLON, in the Central Province

Stem 2–6 in, densely leafy *Leaves* linear, keeled ⅙–⅓ in broad unequally obtusely 2 fid, ... crowded toward ... and petals deep ... the petals, entir ... lip conical, in ... inconspicuous, ... base upwards *Capsule* ½ in, clavate

2 **D. congestum,** *Wight Ic* t 1682, leaves 2–3 in broadly oblong, spike very stout stoutly peduncled simple or shortly branched at the base

TRAVANCORE, in the Iyamallay Hills, *Wight*

Stem very short *Leaves* ½–⅔ in broad, deeply unequally 2 lobed, lobes obtuse *Peduncle* with dense-fld spike 4–6 in, rachis very stout; bracts minute, acute, flowers about ⅓ in diam, colour, lip, spurs, column, anther and pollen much like *D recurvum*

70/2 MYSTACIDIUM, Lindl

Epiphytes, pseudobulbs 0 *Leaves* few ... *Flowers* in axillary racemes small ... ing *Lip* adnate to the base of t... very short, foot 0, anther hinged ... globose attached by separate stra... tropical African and one Cingalese

This genus should I think, be reduced to *Angraecum*

M. zeylanicum, *Trimen Cat Ceylon Pl* 90 Angraecum zeylanicum, *Lindl in Journ Linn Soc* iii 40, *Thwaites Enum* 306

CEYLON, near Galle, *Champion*

Stem 3–4 in *Leaves* 6–10 by ¼ ⅓ in, flat, narrowed to the acuminate apex, rigid, many-nerved *Scapes* many, shorter than the leaves, very slender, rigid,

lax-fld ; bracts minute, truncate, membranous ; pedicel with ovary ¼ in , sepals as long, lanceolate, 5 nerved, petals narrower, 3 nerved, lip nearly as long as the sepals, broadly ovate, finely acuminate, cymbiform, quite entire, spur as long as the ... attached by a point to the column ... slender —I have seen only indif- ... Dr Trimen informs me that it ...

71 ACRIOPSIS, *Reinwdt*

Epiphytes, pseudobulbs clustered, 1-3 leaved *Leaves* flat, linear, not plaited *Scape* from the base of the bulb, slender, simple or branched, ...

A javanica

1 **A. javanica,** *Reinwdt in Flora Literat* 1825, ii 4 *in Syllog Ratisb* 1828, side lobes of lip broad rounded or subtriangular midlobe very small clawed oblong concave, claw lamellate *Blume Bijdr* 377, *Lindl Gen & Sp Orchid* 140, *Walp Ann* vi 492 A picta, *Lindl in Bot Reg* xxix, *Misc* 105 A Griffithii, *Reichb f in Bonpland* ii 92, *Walp l c* A crispa, *Griff Notul* iii 333 *Ic Plant Asiat* t 318 ? Spathoglottis ? trivalvis, *Wall Cat* 3742, *Lindl Gen & Sp* 120

TENASSERIM, *Parish* PERAK, *Scortechini*, and SINGAPORE *Wallich*, &c ... a, Philippines

... leaves 4–6 by ⅓–½ in 2-dentate *Scape* capillary, sepals ¼–⅓ in, white with ... petals subsimilar, lip white with a purple band and lamella *Capsule* ½ in, broadly ellipsoid —It is difficult to reconcile Griffith's figure with the above description of the lip, but his habitat being that of Maingay's plant (Orchard trees, Malacca) seems to identify it

2 **A. indica,** *Wight Ic* t 1748 (*bad*), lip oblong subpanduriform tip rounded, lamellæ opposite the contraction *Walp Ann* vi 492

TENASSERIM, *Griffith* (*in Herb Lindl*) *Parish* PENANG, *Maingay*
A much smaller plant than *A javanica*, with more densely tufted pseudobulbs, ...

... depicted, which is now in Herb Kew

3 **A. Ridleyi,** *Hook f*, lip with small oblong obtuse side lobes and a large orbicular or transversely oblong clawed smooth midlobe, lamellæ on the claw

ed Leaves 3–4 in linear, olive green
l, flowers yellow sparsely spotted with

72 PODOCHILUS, *Blume*

Stems tufted, erect or diffuse *Leaves* many, uniform, distichous flat or equitant and laterally compressed *Peduncles* terminal or leaf opposed, flowers minute racemed or spicate, bracts persistent *Lateral sepals* adnate with the prolonged foot of the column and together at the base, forming a mentum *Petals* broad or narrow *Lip* clawed, jointed to the foot of the column, mobile (always?) erect with a basal appendage *Column* very short rostellum terminal triangular erect bifid or bipartite anther erect, pollinia 4 each pair half enclosed in a calyptriform stipe fixed by a gland to the top of the rostellum *Capsule* very small, ellipsoid —Species 12 or more, Indian and Malayan

The flowers of all the species want careful examination on a living state There are great differences in the columnar structure and pollinia that cannot be satisfactorily determined from dried specimens These last are almost in all cases deficient in flowers which are easily detached and so minute as to escape the notice of collectors

* Leaves equitant laterally compressed not articulate with the sheath *Flowers* secund, on inclined or decurved lax fld racemes

1 **P. cultratus,** *Lindl in Wall Cat* 7336, *Gen & Sp Orchid* 234, *in Journ Linn Soc* iii 37 leaves ensiform subfalcate acute, lip cuneately oblong truncate 5 nerved base saccate

TROPICAL HIMALAYA, Nepal *Wallich* Sikkim *J D H* ASSAM, *Masters* CACHAR *Clarke* TENASSERIM, the Attran River, *Parish*

Stem 3–7 in with the leaves ⅓–⅔ in broad *Leaves* ⅓–⅔ in, many nerved *Peduncle* short decurved, bracts ovate lanceolate; flowers ⅛ in long, dorsal sepal broad, 5 nerved lateral subacute, petals broadly obovate acute, 3 nerved mentum saccate base of lip broad *Capsule* ¼ in —The lip resembles that of an *Appendicula*, I doubt its being articulate and mobile

2 **P. falcatus,** *Lindl Gen & Sp Orchid* 234 leaves ensiform obtuse lip narrowly clawed oblanceolate 3 nerved, base with a short notched appendage *Thwaites Enum* 306

Rostellum with an involute
cor[illegible]d gland minute In
ly appressed to one another,
e stem across the leaves is

only ⅛ in

3 **P. malabaricus,** *Wight Ic* t. 1748, fig 2, leaves obtuse spike many fld much longer than the leaves, mentum very short, lip linear lanceolate obtuse contracted in the middle *Walp Ann* vi 893

MALABAR, *Jerdon*, Wynaad jungles *Drew* TRAVANCORE *Johnson*

Stem 3–5 in, fleshy, ⅛ in across the leaves *Leaves* ⅛ in, straight Spike

4 **P. saxatilis,** *Lindl Gen & Sp Orchid* 235, leaves short recurved obtuse, lip oblanceolate obtuse 3 nerved *Thwaites Enum* 307

CEYLON, Hantani and Ambigamowa districts, *Macrae, Thwaites*

Stems 2 3 in, fleshy *Leaves* $\frac{1}{4}$ $\frac{1}{3}$ in *Peduncle* terminal, $\frac{1}{2}$ in, drooping, few fld, bracts ovate, smaller than the yellow flowers, lip red in the middle, lateral sepals obtuse, petal obovate oblong, obtuse, mentum short —Description of flowers from a drawing by Lindley

** Leaves flat, not equitant or laterally compressed

† *Leaves broad Scapes lateral*

5 **P. unciferus,** *Hook f Ic Plant ined*, leaves $\frac{3}{4}$ 1$\frac{1}{4}$ by $\frac{1}{2}$ $\frac{3}{4}$ in oblong, tip rounded peduncles many very slender flowering at the tips, lip spathulate, basal appendage long slender uncinately recurved

PERAK, *Scortechini* —DISTRIB Borneo Philippines

Stem erect, 18 24 in *Leaves* $\frac{1}{2}$ amplexicaul, shining tip minutely mucronately toothed *Peduncle* longer than the leaves, erecto patent, flexuous with scattered acicular sheaths, raceme terminal capillary 1 2 fld bracts orbicular, flowers $\frac{1}{8}$ in long, dorsal sepal broad, 3 nerved, lateral acuminate mentum cylindric, petals broad, acute, 3-nerved, claw of lip slender jointed on the shortly free foot of the column, basal appendage grooved, truncate, column unarmed

†† *Leaves very small, linear acicular or lanceolate Scape terminal or nearly so*

6 **P. microphyllus,** *Lindl in Wall Cat* 7335 A *Gen & Sp Orchid* 234 *in part*, stems filiform diffuse, leaves $\frac{1}{6}$–$\frac{1}{4}$ in elliptic lanceolate awned spike as long as the leaves capillary flexuous 3–4 fld, bracts most minute, lip ovate oblong or lanceolate 3 nerved, basal appendage quadrate

TENASSERIM, at Mergui, *Parish* MALAY PENINSULA common —DISTRIB Borneo, Cambodia

Stems 6–8 in, flexuous rarely branched *Leaves* articulate on the sheaths, 7–9 nerved *Flowers* $\frac{1}{10}$ in long, white and purplish, mentum very variable,

dorsal sepal ovate,
variable, obtuse or
oncave or margins
$\frac{1}{8}$ in ellipsoid —
have not detected

7 **P. khasianus,** *Hook f Ic Plant ined* stems suberect slender, leaves $\frac{1}{3}$–$\frac{1}{2}$ in linear acute, spike very short few fld bracts as long as the flowers ovate lanceolate, lip narrowly oblong emarginate 3-nerved base cordate P microphyllus *Wall Cat* 7335 B, *Lindl Gen & Sp Orchid* 234 *in part*, *in Journ Linn Soc* iii 37

SILHET, *Wallich* KHASIA HILLS at Amwee, *J D H & T T*

Stems 4 6 in, simple, suberect *Leaves* articulate on the sheath rigid often twisted *Peduncle* shorter than the leaves, bracts rigid strongly nerved, flowers $\frac{1}{12}$ in long, lateral sepals acute nerve strong, mentum globose petals obovate-

microphyllus, but especially in the structure of the column

8 **P. lucescens,** *Blume Bijdr* 295, t 12, *Rumphia* iv 43 (*in Obs*), lliptic- or linear oblong obtuse or apicu- acts spreading and incurved, lip obovate *Lindl Gen & Sp Orchid* 234, *Reichb f Hamb* 45, *in Trans Linn Soc* xxx 145

TENASSERIM, at Mergui *Helfer*, *Parish* —DISTRIB Sumatra, Java, Borneo

Stems 4–8 in, rigid *Leaves* black when dry, opaque, many nerved *Spike* ½–1 in, flexuous, flowering to the base, bracts $\frac{1}{10}$ in, strongly nerved, flowers $\frac{1}{10}$ in diam

9 **P. acicularis,** *Hook f Ic Plant ined*, stems densely tufted filiform, leaves ⅙–¼ in acicular, spike very short 3–4 fld, lip broadly oblong or obovate 3 nerved, base cordate with an incurved horn on each side

PENANG *Maingay* (*Kew Distrib* 1653/2) PERAK, *Scortechini*, &c

Stems 6–8 in, flexuous, diffuse *Leaves* suberect, finely acuminate *Flowers* $\frac{1}{12}$ in long, white, bracts very minute, sepals obtuse or acute petals linear, obtuse, columnar arms ntate tip of the at length 2-fid, is attached by a with a cuneate

73 APPENDICULA, *Blume*

Stems tufted, leafy, often compressed *Leaves* numerous, distichous, uniform, vertical, jointed on their sheaths *Peduncles* terminal and leaf opposed, flowers minute, racemed spicate or capitate, bracts persistent *Sepals* connivent, lateral connate at the base and adnate to the produced foot of the column, forming a mentum *Petals* various *Lip* erect, inserted on the foot of the column or with its sides adnate to it *Column* very short, rostellum erect 2 fid, anther dorsal, erect, pollinia 8, 4 often imperfect, clavate attached in fours to the tip of the rostellum by a point or gland *Capsule* very small —Species 20 or more, Tropical Asiatic, Australian, and Polynesian

* Lip adnate below by a broad saccate claw to the sides and face of the foot of the column

† *Limb of lip with a large callus on the disk*

1 **A. bifaria,** *Lindl in Hook Kew Journ* vii (1855) 35, leaves 1–1½ by ⅓ in oblong obtusely 2 toothed, racemes chiefly terminal very short, mentum saccate rounded, lip ovate oblong base calceolar, sides of column produced into ensiform processes as long as the rostellum *Benth Il Hongk* 358, *Walp Rep* vi 893 A reduplicata, *Reichb f in Bot Hamb* 15

CACHAR, *Keenan* TENASSERIM, *Helfer* SINGAPORE, *Ridley* —DISTRIB China.

having many racemes, but differ in having a more 3-lobed lip, a broader margin to

Scortechini

†† *Lip without a median callus on the disk*

2. **A. callosa,** *Blume Bijdr* 303, leaves ½–1 by ⅛ in oblong strongly 2-fid., sheaths 2-cuspidate, flowers in terminal bracteate heads, lip very shortly ovate with a large transverse basal appendage *Lindl Gen & Sp Orchid* 230, *Griff in Calc Journ Nat Hist* v 362, t 62, *Saunders Refug Bot* t 45, *Reichb f Otia Bot Hamb* 45 A stipulata, *Griff Notul* iii. 308, *Ic Plant Asiat* t 335, f 2

TENASSERIM, *Griffith, Parish* PENANG, *Walker*, &c PERAK, *Scortechini*, &c —DISTRIB Java, Borneo

Stem 6 18 in, simple *Leaves* close together, coriaceous, base truncate, tip not contracted *Heads of flowers* sessile, bracts lanceolate, scarious, obtuse, many-

curiously pitted

3 **A. Lewisii,** *Griff in Calc Journ Nat Hist* iv 378, t 19, *Notul* iii 300, *Ic Plant Asiat* t 337, leaves 1 3 by ½–⅔ in linear- or oblong lanceolate 2 dentate, racemes very short leaf opposed, mentum subglobose, lip ovate many-nerved base calceolar *Walp Ann* vi 893 A cyathifera, *Reichb f mss* Metachilum cyathiferum *Lindl in Wall Cat* 2022, *Gen & Sp Orchid* 74 Dendrobium vaginatum, *Wall mss*

PENANG, *Maingay* (*Kew Distrib* 1616) *Curtis* PERAK, *Scortechini, Wray* SINGAPORE, *Wallich*

Stem 6–18 in, unbranched, flattened, ⅛ in broad *Leaves* rather distant and membranous, sheaths 1 in long *Racemes* axillary and terminal, 1 1¼ in, many-fld, bracts small, ovate lanceolate, reflexed, flowers about ⅓ in long, yellow green, sepals acute, petals elliptic, 1-nerved, claw of lip adnate throughout its length to the foot of the column, column without arms *Capsule* ⅓ in, subcylindric

** Lip attached by a short free claw to the apex only of the foot of the column.

4 **A. cordata,** *Hook f Ic Plant ined*, leaves 1 by ¾ in oblong obtusely bidentate, spikes very short incurved few fld, mentum obscure, foot of column very short, lip ovate cordate 3-nerved with a semilunar ridge towards the base

PERAK, *Scortechini.*

Stem (of the only specimen) 7 in, unbranched *Leaves* rather membranous,

apiculate between the teeth, sheaths $\frac{1}{5}$–$\frac{1}{4}$ in *Spikes* $\frac{1}{4}$ in, 3–4 fld, bracts sheathing the rachis, erect during flowering, then reflexed, strongly nerved, flowers about $\frac{1}{10}$ in long, dotted; sepals ovate, obtuse, 1 nerved, base of lateral gibbous, petals large obovate, 1-nerved, column unarmed, rostellum very large, ovate — The curious incurved spikes and spreading nearly symmetrical lateral sepals, and short foot of the column, are all unlike other species of the genus The solitary specimen may not represent the plant fairly

5 **A. Kœnigii,** *Hook f Ic Plant ined*, leaves $\frac{3}{4}$ by $\frac{1}{6}$ in oblong-lanceolate obtuse and minutely obtusely 2 fid, racemes minute leaf-opposed 2–3 fld, flowers most minute, mentum globose lip ovate or oblong 5 nerved base calceolar Epidendrum hexandrum, *Kœnig in Retz Obs* vi 15

INDIA, *Herb Rottler* (1779)

Stem densely tufted, 1 6 in, very slender *Leaves* close set, membranous, base rounded, sheaths $\frac{1}{2}$ in *Racemes* $\frac{1}{6}$–$\frac{1}{5}$ in, decurved, rachis slender, flexuous, bracts lanceolate, reflexed after flowering, flowers $\frac{1}{10}$ in long, sepals ovate, acute, and elliptic petals 1-nerved, lip saccate at the base, column unarmed —Of this very distinct species I have seen only one specimen in Rottler's Herbarium, now at Kew In its slender tufted habit (upwards of twenty stems on a tuft) and minute racemes and flowers it is like no other, no locality is attached, to the specimen or to Kœnig's description, and as Rottler received (through Heyne) plants of both Indian Peninsulas, none can be assumed

6 **A. torta,** *Blume Bijdr* 303, leaves $\frac{1}{2}$ by $\frac{1}{4}$ in oblong tip rounded emarginate, bracts of terminal sessile spike as long as the leaves densely equitantly imbricate acute falcately recurved complicate and enclosing the solitary flowers, mentum cylindric, lip narrowly panduriform twisted, margins incurved waved, narrow base calceolar suddenly dilated into a broad transversely oblong retuse serrulate concave terminal lobe *Lindl Gen & Sp Orchid* 230, *Reichb f. Xen Orchid* ii 117, t 138

PERAK, *Scortechini* —DISTRIB Java, Borneo

Stem 6 18 in, simple or branched compressed, $\frac{1}{8}$ in broad *Leaves* close-set, spreading, thin, base rounded, sheaths $\frac{1}{6}$–$\frac{1}{4}$ in *Bracts* of spike membranous, forming a terminal flattened coloured crest as broad as the rest of the branch, and coterminous [illegible] ls erect, aristately acuminate, [illegible] 3 nerved, column unarmed, [illegible] is very meagre, but I cannot [illegible] amed specimen in Herb Kew,

[illegible] 1¼ by [illegible] gate [illegible] sub

PERAK, S[illegible]

Stem 12-[illegible] ¾ amplexicau[illegible] obtuse, 5 ne[illegible] obtuse 3 nerved, lip concave, yellow and purple; column unarmed, anther short *Capsule* ¾ in, slender

8 **A. lancifolia,** *Hook f Ic Plant ined*, tall, leaves 3–4 by $\frac{2}{3}$–$\frac{3}{4}$ in lanceolate obtuse 2-dentate, racemes elongate simple or branched stout many- and dense fld, mentum cylindric, lip obovate oblong 3-lobed, side lobes small rounded, midlobe broadly ovate acute, base narrowly calceolar.

PERAK; on G[illegible]

Stem 12 24 in,
½ in *Racemes* 3
stout; bracts ⅙ 1
⅙ in long, bright
obovate-oblong, 3-nerved, column unarmed, anther is broad as long *Capsule* ⅓ in, fusiform, strongly ribbed, claret-coloured —Very like *A cristata*, Blume, of Java, but the limb of the lip is not ' rounded emarginate and crested on either side "

9 **A. Maingayi,** *Hook f Ic Plant ined*, leaves 2 3 by ⅙–¼ in linear-lanceolate tip dilated apiculate, racemes terminal many and dense fld, bracts spreading and incurved, mentum sub cylindric or shorter, lip elliptic- or ovate-oblong 5 nerved, base calceolar, tip rounded

PERAK, *Scortechini* PENANG, *Maingay*, (*Kew Distrib* 1617)

Stems 6–16 in, rather slender or stout, unbranched *Leaves* suberect, narrowed at the base, tip minutely 2-fid or rounded *Racemes* 1 2 in, simple or branched at the base, suberect, flexuous, bracts $\frac{1}{12}$–⅙ in, deflexed, then incurved, coriaceous, subacute, 5-ribbed, flowers $\frac{1}{10}$ in long, lateral sepals broad, obtuse, nerve slender, petals linear or obovate oblong, 3 nerved, lip concave, column unarmed, rostellum short, triangular, anther ovate, acuminate *Capsule* ⅓ in, fusiform —The Perak specimens are more slender than the Penang, the mentum is longer and more cylindric, the petals narrower, 1 nerved The species should be compared with *A graminifolia*, Teysm and Binnend

IMPERFECTLY KNOWN SPECIES

10 **A. echinocarpa,** *Hook f Ic Plant ined*, leaves ⅓–½ in close set orbicular-oblong coriaceous margin thickened upper base reflexed, spike short terminal few fld, bracts orbicular concave, capsule ellipsoid, valves densely clothed with soft bristles

[illegible] *Wray*
[illegible] semi amplexicaul, pale,
[illegible] imbent teeth, upper base
[illegible] —A very remarkable
species

A LONGIFOLIA, *Blume Bijdr* 304, *Lindl Gen & Sp Orchid* 230? *Thwaites Enum* 806 CEYLON Ambagamowa district, rare, *Thwaites* (C P 3208) Of the plant thus doubtfully referred by Thwaites to the Javan *A longifolia*, this author says that the flowers are not in a sufficiently perfect state for analysis Blume thus describes *longifolia*, "Stems simple compressed, leaves linear lanceolate retuse, flowers densely capitate " Thwaites adds, ' leaves 3 5 by ⅓ in, retuse, mucronate " Can the Ceylon plant be an *Agrostophyllum* or *Phreatia*?

A TERES, *Griff Notul* iii 359, *Ic Plant Asiat* t 332 is *Ceratostylis teres*, R. f see v v p 825

A SP, *Griff Notul* 359, *Ic Plant Asiat* 335, fig 1 analysis only, from Affghanistan, cannot (as Lindley in Hook Kew Journ vii 36 observes) be an *Appendicula*

74 THELASIS, *Blume*

Epiphytes, with either small 1–2-leaved pseudobulbs, or with short compressed stems clothed with equitant leaf sheaths *Leaves* oblong or linear-oblong flat, or loriform and jointed on the sheath *Scap* from the base of the pseudobulb, or lateral on the stem, with 1–3 small sheaths, flowers very minute, spicate, cellular *Sepals* connivent, dorsal flat, lateral concave keeled or winged *Petals* narrow, membranous *Lip* sessile at the

base of the column, erect, ovate or oblong *Column* very short, sessile, foot 0 rostellum terminal, large, er
2–4 celled, pollinia very minute, g
tip of the rostellum, gland small
—Species about 10, tropical Asiatic and Pacific

I am not well satisfied as to the character of lateral sepals in this genus, as to their being winged or not, the sepals are very soft, and their exact structure not very clear in specimens that have been dried, and again moistened

Sect I EUTHELASIS *Pseudobulbs* 1–2 leaved

* *Lateral sepals distinctly strongly keeled or winged*

1 **T. pygmæa,** *Lindl in Journ Linn Soc* iii 63, scape 1–2 in longer than the solitary linear leaf spike very short lax fld, lip ovate acute contracted towards the tip *Par & Reichb f in Trans Linn Soc* xxx 145, *Walp Ann* vi 923, Euproboscis pygmæa *Griff in Calc Journ Nat Hist* v 371 t 72, Wight Ic t 1732

NEPAL (*Cult in Hort Bot Calc fid Griffith*) MALABAR *Jerdan* TENASSERIM, at Moulmein *Parish*

Pseudobulbs ½–⅔ in diam *Scape* very slender, curved, spikes ¼–½ in long, bracts ovate, acuminate flowers $\frac{1}{10}$ in long, dorsal sepal ovate lanceolate acute lateral linear oblong, lip 3-nerved, with rounded sides from the middle to the base rostellum 2 fid—The Malabar plant seems the same as the Tenasserim, but is in a Peloria state, triandrous with the petals and lip similar, ovate lanceolate, 1 nerved, ovary with imperfect ovules

Var *multiflora*, leaf larger 3 4 by ½ in, scape stouter 4 5 in, spike 1½ 2 in —Sikkim Himalaya, alt 1000 ft, *Treutler*

2 **T. ? capitata,** *Blume Bijdr* 386 scape 4–6 in stout longer than the solitary linear leaf, spike cylindric dense fld, rachis pitted, lip oblong ovate obtuse

PERAK, *Scortechini* —DISTRIB Sumatra, Java

sub
long
win
Diff
rost
ovate lip narrowed to the apex

3 **T. elongata,** *Blume Orchid Archip Ind* 23, t 7, f 2, and t 5, fig C scape 4–6 in longer or shorter than the solitary linear leaf, spike cylindric dense fld, lip ovate acute or acuminate

SINGAPORE, at Johore, &c, *Ridley* LANGKAWI, *Curtis*

Pseudobulb very various in form *Leaves* and spike as in *T capitata*, from

** *Lateral sepals not strongly keeled or winged*

4 **T. bifolia,** *Hook f Ic Plant ined*, scape 8 in much longer than the two opposite elliptic lanceolate acuminate leaves, spike very lax fld, lip broadly elliptic obtuse

KHASIA MTS, *Lobb*

Pseudobulb ⅜ in diam. *Leaves* 3½ by 1¼ in, spreading, base contracted. *Spike* 2 in, bracts broadly ovate, obtuse, flowers ⅛ in long, sepals broad, obtuse, petals obovate-oblong, 1 nerved, lip obscurely 5 nerved, broadest in the middle; rostellum very long, acuminate, entire

5 **T. khasiana,** *Hook f Ic Plant ined*, scape with spike 3–5 in about equalling the solitary petioled linear leaf, spike elongate lax-fld, lip elliptic-ovate subacute T. pygmæa, *Lindl in Journ Linn Soc* iii 62 (*in part*)

KHASIA MTS, alt 3–4000 ft, *Lobb, J D H & T T*

Pseudobulbs ⅜-in, depressed-globose *Leaves* 2–4 by ⅓–⅝ in *Scape* and spike rather stout, bracts ovate lanceolate, sepals ovate lanceolate, obtuse, petals lanceolate, obtuse, lip 3 nerved, broadest rather nearer the base than tip, rostellum large, acute —Very like *T pygmæa*, but a much larger plant, without keel or wing on the sepals

6 **T. longifolia,** *Hook f Ic Plant ined*, scape stout with the spike 6–9 in about equalling the solitary leaf, spike elongate lax fld, lip elliptic ovate acute

KHASIA MTS *J D H & T T*

Differs from *T khasiana* in being very much larger, and in the acute lip *Pseudobulb* ⅜–1¼ in diam, depressed globose *Leaf* sometimes falcate, ⅔–1¼ in broad, *flowers* ⅙ in long

Sect II OXYANTHERA, *Brongn* (Gen) *Pseudobulb* 0, stem short, clothed with the equitant sheaths of the linear leaves which are jointed at the sheath (Oxyanthera is a very natural group)

7 **T. elata,** *Hook f Ic Plant ined*, leaves 10–14 by 1–1¼ in tip rounded, scape equalling or exceeding the leaves, raceme long slender lax fld

PERAK, on decayed wood, *King's Collector*

Rootstock as thick as the little finger *Leaves* few, sheaths 2–2½ by ½ in, complicate, coriaceous *Scape* very slender, flexuous, sheaths 3 4, ½ in long, membranous, lanceolate, bracts ovate, acuminate spreading and reflexed, flowers ⅛ in, narrow, shortly pedicelled, sepals linear oblong, acute 1-nerved, venation distinct, petals lanceolate, acute, lip erect, claw short broad, limb linear subacute, margins waved, base broadly 2-auricled, auricles revolute, rostellum 2 partite, segments obtuse, pollinia 8, shortly obovoid —Near *T carinata*, Bl of which I have seen no flowers), but the leaves are very much longer the scape very slender, raceme longer, and bracts acuminate

8 **T. decurva,** *Hook f Ic Plant ined*, leaves 4–6 in, tip narrow or rounded and obtusely notched or subacute scape very slender, raceme very short decurved, bracts reflexed, lip dagger-shaped from a concave cuneate base terete and fleshy beyond the middle with the crisped margins inflexed and close to the mesial line

SINGAPORE, at Krangi, *Ridley* PENANG, or Government Hill, *Maingay*

Leaves ⅓–⅜ in broad *Scape* shorter than the leaves, filiform flexuous, sheaths 1-2 lanceolate, raceme ½ in, pedicels ⅙ in, longer than the oblong bracts, flowers ⅛ in long, pale fawn colour, sepals ovate-lanceolate acute and narrowly oblong obtuse petals 1 nerved — This much resembles the figure of *O* ... *ha* Brongn, which is figured as having a stout broadly ovate obtuse lip narrowed into a broad short claw, base concave The leaves of some specimens are narrow at the tip, others have 2 rounded lobes

DOUBTFUL SPECIES

T carinata, *Reichb f in Trans Linn Soc* xxx 137, ? of *Blume Bijdr.* 385 & *Lindl Gen & Sp Orchid* 253 In the absence of flowers it is impossible to say eatly from the figure of Blume's *T carinata* ape, short decurved raceme, and bracts, in all *T decurva*, and is nearer to the Moluccan *y Bot* 198, t 37 B) than to *T carinata*

Tribe III **NEOTTIEÆ.** (See vol v, p 668)

75 GALEOLA, *Lour*

Leafless, rarely leafy, yellow or brown climbing or erect herbs, stem or branches terminating in loosely panicled often drooping racemes or panicles, flowers rather large *Sepals* subequal, concave, connivent or

* Stem simple, erect

1. **G. Lindleyana.** [illegible] l, very robust, sepals broadly ovate [illegible] ither recurved clothed with long papi [illegible] *Thoms in Ill Himal Plant* t 22 [illegible] *Bonpland*, v 37

SIKKIM HIMALAYA, alt 4-7000 ft, *J D H*, &c ?KHASIA HILLS, alt 4000 ft, *J D H & T T* NAGA HILLS *Prain*

panded rounded limb erosely fimbriate, glabrous without almost bearded within *Capsule* 5-6 by ¾ in, fusiform, subacute, obtusely trigonous, red brown, tardily dehiscing

2 **G. Falconeri,** *Hook f*, tall, very robust, sepals broadly ovate dorsally nearly smooth, anther glabrous Pogochilus, *Falc in Hook. Journ Bot* iv (1842), 73

rac
a f
not and it myself

3 **G. javanica,** *Benth in Gen Plant* iii 590, dwarf, stem very stout glabrous below furfuraceous above, sepals oblong membranous, anther subhemispheric Cyrtosia javanica *Blume Bijdr* 396, t 6, *Rumph* i 19?, t 69, *Lindl Gen. & Sp Orchid* 138, *Reichb. f Xen Orchid* ii 76 t 12?

ASSAM, *Masters (Ic in Hort C lcutt)* —DISTRIB Java

Sem a span h gh from branch ng t bers *Flowers* n d am —The d ut feat on of the A am dra ng w th Blume s figure and descr pt on is necessar ly imperfect but as far as it goes there s no re on to suppose tl t tl ese represe t two sp c

4 ? **G pusilla,** *Hook f* stem flexuous from a woody nodose root stock with several sl ort tubular basal sheatl s and two open ones h gher up 3 fld bracts lanceolate equalling the ovary sepals broadly ovate oblong subacute petals as large obtuse lip orb c lar concave retuse with a very small obtuse apical lobe in the s nus disk papillose with 3 central lo v ridges

PEGU on tl e Poolee r l es *Ku* (*n Herb Calc t*)

Whole plant n h gh wh te rootstock tort o s woody as tl ck as a sparrow s qu ll w th oody roots as tl ck as the stock *S* slender bas l sheatl s —½ n

** *Stem branched sca de t*

G stem blong rtosia *ch d part*

PENANG *Curt s* PERAK *Scortechini* —DISTRIB Malay Islands

Root of fl hy tl k fibres *S* 50 100 ft ex s oly bran l l flexuous flesly and hard redd h bra l es sl d r nternod s s o len sp kes 6–10 n pendulous flowers ½ in lo g sepals obtus 5 ner ed and u r 3 ne ed petals th ro nded t ps l p cymb t rn t p rounded ero el el d k tl a me l broad fl hy pub rulous d k red l ng to the n ll e b yond l l s a 2 lobed ooly s les of l p tl n t an e sely barred w h ju yl l len er ner es and impres d t a rs colum r l e lo g ntler tr ior *C p s e* l near 3 10 n long acum ate v l es n e nb a ous

G **Hydra**

Nat m 247 Frythrorcl s altiss ma *L* *Il* & *Sl* *Orcl* *l* 40 t *part* (*not of Blum*)

SIKKIM HIMALAYA n the T st valley *K ng* TENASSERIM t Moulme n *P* *l* PENANG *Curt* PERAK S NGAPORE nd MALACCA *H* *h* &c — DISTRIB J Su tr

A lofty l mb r br ches n l stout r t a *C al s m* n or cence l s ly bra el l flo rs c l r l a l pe l b ler and l tl o t tl flat a l t f t l ll es s o *ll* a n He l l co s s of fru t o tl at pl t nd lo b of tl

" **G Cathcartii,** *H k f* branches very r b st sepals and petals l near ol long re olute l p cymb form acute rg n rted l late and d ate l l n h l

SIKKIM H MALAYA (*J* *C* *hc rt*)

Mr Cathcart's drawing represents a portion of a stem as thick as the little finger, bearing a branched panicle a foot long which, as well as the flowers, is dull yellow and furfuraceous, the flowers are 1-1½ in diam, the lip not nearly as concave as in *G Hydra*, yellow with red veins —A remarkable plant, very unlike its congeners, but the drawing of the habit, column, anther, and pollen leave no doubt as to its genus

76 VANILLA *Swartz*

Climbing rooting branched, leafy or leafless shrubs, stems terete or angled *Leaves* subsessile, coriaceous or fleshy *Peduncles* short axillary, flowers large *Sepals* and petals subequal spreading *Lip* with the claw adnate to the column, which is embraced by its broad concave limb *Column* elongate, anther incumbent, cells separate, pollen granular *Capsule* long fleshy, 1 celled, loculicidally 3 valved without septa — Species about 20, tropical

The Indian species of this genus are most scantily represented in Herbaria, and imperfectly by drawings or descriptions

* *Stem leafless*

1 **V. Walkeriæ,** *Wight Ic* t 932, stem very stout, flowers 2 in long sepals oblanceolate, petals broader spathulately obovate acute margins undulate, epichile of lip ovate acute margins undulate, disk with two ridges below the middle *Thwaites Enum* 311

TRAVANCORE and TREVANDRUM, *Wight* CEYLON, *Walker*
Stem as thick as the thumb *Racemes* 5-6 in, many fld, flowers white, bracts ovate

2 **V. Wightiana,** *Lindl in Wight Cat* 2091, flowers 1 in long, sepals linear oblong petals lanceolate, epichile of lip ovate, its disk fringed with long hairs V aphylla, *Lindl Gen & Sp Orchid* 436, *in part (not of Blume)*

The DECCAN PENINSULA, *Wight*
The specimens are very imperfect and the description of the flowers is taken from a rude sketch by Lindley The flowers are not half the size of those of *V Walkeriæ*

3 **V. Parishii,** *Reichb f Otia Bot Hamb* 39, flowers 1-1¼ in long, [illegible] s broadly oblanceolate [illegible] ate or rounded crisped [illegible] a dense brush at the [illegible]

TENASSERIM, *Parish*
This may prove the same as *V Wightiana*, Lindl It is very near the Javanese *V aphylla* Blume

** *Stem leafy*

4 **V. Moonii,** *Thwaites Enum* 312, leaves elliptic- or linear oblong often falcate obtusely acuminate lip with a broad crenulate undulate apex, a thick pencil of excessively fine hairs on the disk, and beyond it towards the apex some loose flexuous bristles

Leaves 5-7 in many nerved, subsessile *Spikes* 1-3 in, very stout many-fld, bracts ovate, ½ in, obtuse; sepals about 1 in long, pencil of hairs on the disk terminating below in a stout stipe, hairs of equal length forming a truncate brush

5 **V. albida**, *Blume Bydr* 422, t 34, *Rumph* 1 197, t 67, leaves
ng sub
a large
binately
lb f in
Bonpland 11 (1854), 88 Vanilla, sp *Griff Notul* 111 207, *Ic Plant Asiat* t 281 Vanilla, *Wall Cat* 7401

PENANG, *Wallich*, *Curtis* PERAK, SINGAPORE and MALACCA, *Griffith*, &c — DISTRIB Java

Climbing to 50 ft *Leaves* very variable, 3 7 by 1½ 4 in, sessile or shortly petioled *Spikes* 2 3 in, very
waxy white, sepals ⅝ in long,
but thinner and many nerved w
below the apex, column rather l

DOUBTFUL SPECIES

V APHYLLA, Blume? ex *Wight Ic* t 931 leafless, stem angular, peduncle elongate as thick as a swan s quill racemes 3 4 in very stout many fld bracts ovate acute, pedicel with ovary 2 in sepals as long oblanceolate oblong acute petals

hypochile

77 CORYMBIS, *Thouars*

Tall, terrestrial rigid, leafy herbs roots fibrous *Leaves* broad plaited *Flowers* in short axillary stiff sessile spreading panicles *Sepals* and *petals* very narrow linear at first cohering in a tube with spreading tips persistent *Lip* erect from the base of the column linear channelled tip dilated and recurved *Column* usually as long as the petals erect terete, tip clavate and 2 lobed or auricled rostellum at length 2 fid stigma erect, transverse saccate anther narrow erect acuminate 2 celled pollinia clavate attached by a subulate caudicle to a peltate gland *Capsule* linear or fusiform —Species 6 7, tropical

1 **C. veratrifolia**, *Blume Orchid Archip Ind* 125 t 42 E, 43 f 1 (Corymborchis), leaves elliptic lanceolate caudate acuminate flowers 1–1¼ in long sepals and petals subsimilar narrowly oblanceolate blade of lip lanceolate acuminate, ribs of capsule smooth (disticha *Lindl Fol Orchid* 1 (*in part*) Macrostylis disticha *Bcl t Gen* { *Sp Orchid Javan* t 2 Hysteria veratrifolia *Rein in Bot Zeit* 1825 11 5 *Lindl Gen & Sp Orchid* 439 Rhyncanthera paniculata *Blume Bydr* t 78 Corymborchis assamica, *Blume Orchid Archip Ind* 126 t 43, f 2 A

SIKKIM HIMALAYA in tropical ravines, *J D H* ASSAM *Griffith Jenkins* CHITTAGONG *J D H & T T* ANDAMAN ISLANDS *King s Collector* MALAY PENINSULA *Maingay* &c MALABAR tl Nilgiri Hills and Courtallam *Wight* CEYLON, Matturatte *Moon* —DISTRIB Java Sumatra Borneo

Stem 4 ft high as thick as a swan s quill *Leaves* 10 18 in ses le on the sheaths, nerves very many and strong *Panicles* 4 6 in long and broad bracts ¼ ½ in ovate lanceolate flowers green h white column long *Capsule* in Ic Blume 2 in long —I am not sure that the plants from the above localities are all of one species The Sikkim and Assam ones are in a young state only, the Perak and

Nilghiri in flower only The ripe fruit of the Andaman species is 1 in long The Ceylon one has much shorter points to the leaves but the fruit is as large as in Blume's figure Blume distinguishes *C assamica* by the column being as long as the capsule, which they are in typical *veratrifolia*

2 **C. longiflora,** *Hook f*, leaves elliptic lanceolate acuminate, flowers 1½-2 in long sepals very slender with very narrow blades, petals oblanceolate blade of lip orbicular cuspidate

PERAK, *Scortechini*, *King's Collector* MALACCA, *Maingay* (*Kew Distrib* 1661)

Stem 8–10 ft high, as thick as the little finger, leaves much broader than in *C. veratrifolia* and flowers twice as large, white *Column* long *Fruit* not seen

3 **C. rhytidocarpa,** *Hook f*, leaves lanceolate acuminate, flowers 1 in long, sepals narrowly oblanceolate, petals oblanceolate crenate, blade of lip triangular ovate acuminate ribs of fruit strong wrinkled

which the broader petals, long with wrinkled ribs

4 **C. brevistylis,** *Hook f*, leaves 5–6 in elliptic acuminate sub petioled, column ⅓ in long

PERAK, on limestone rocks, *King's Collector*

Stem 1 2 ft, slender *Leaves* 7 nerved, 2–3 in broad *Panicles* few fld Young *fruit* 1 in long —A very distinct species, probably the same as an undescribed Javan one

78 TROPIDIA, *Lindl*

Terrestrial, glabrous, leafy herbs *Stem* often branched roots rigid *Leaves* sessile membranous sub plicate, petiole sheathing *Flowers* small, in axillary and terminal sessile or peduncled spikes, bracts coriaceous, often imbricate, strongly nerved *Sepals* connivent lateral more or less

Chinese.

Sect I CNEMIDIA *Lip* spurred *Spike* terminal, peduncled

1 **T. angulosa,** *Blume Orchid Archip Ind* 122, leaves elliptic

SIKKIM HIMALAYA alt 1000 ft, *Clarke*, *King* SILHET, *Wallich* TENASSERIM, *Lorish* UPPER BURMA, *Griffith* MALABAR and TRAVANCORE, *Wight*, &c

Stem 8 12 in *Leaves* 3–5 by –5 in, base rounded or cordate *Peduncle* short; spike 1 2 in, bracts ¼ ½ in, as long as the flowers; sepals 3 5-nerved, lateral lanceolate acuminate, connate nearly to the apex dorsal linear lanceolate acute; petals rather narrower, ovate lanceolate, obtuse, 3 5-nerved, midnerve very

stout l ŀ nearly as long as tl e pet ls obt se lateral nerves narrowly lamellate l elow tl e n d lle colu   tl a lo g sle ler ro tellu   antl er n rrowly lanceo late poll n ı clavat gr s la ell for   a l ele lo g sle ler gl nd n   te — I l ave exam ned I ndl s sp c c   of *T se l be a* a d f l that l e s n error suppo n tl t tl e late l s p l are f c to be o tl e   d lle t does not l ff r from *T a g losı*

Sect II TROPIDIA PROPER *L p cymb form not spurred*

* *Flo re s ı ı slo t s r le ax llary or x lla y d t r n al sp kes*

2 **T. curculigoides,** *L ll ı Wall (t* 7386 A *Ge & Sp Orch l* 197 bracts ovate acuminate lip with a reflexel t p a tl ickenel midnerve and intramarginal ridges f om bey nd tl e ıddle to tl e base of the reflexed t p   l as an ca *Bl e O cl d* 1r *I ŀ Inl* 191 t 11 f 2

SIKKIM HIMALAYA *K g*   SILHET ASSAM and BU MA *Wall ch* &c ? PERAK *K ra*

Stem 1 2 ft *Le ves* 6 10 b 1 1   ell pt c o l ea lanceolate a d te acum nate o nerved *Sp kes*   n cre t or d c   el b cts n brc te 1 n o ate la ceolate upper narro er   sepal 2 ın long stro gly 5 erve l dorsal l near lanceolate lateral strongly r cur ed la c olate f o   ovate b se tape po nted petals rath r sl orte obl quely ovate o long obt e 5 er e l l p mucl sl orter tl an the sep ls *Capsule*   lo g Bentl n n Flo a of Hong I ong has referred Schauer s *Ptychochilus septem e s* of Cl na to tl   but a cord g to S hauer s figure t d ffers n tl   sm lle flowers tl ovat acute sepal and a l p tl o t tl er fl xel t p W l l s 386 B from Burma   d fferent spec es but n too mperfect a state for a alys

3 **T graminea,** *Bl n O cl d A cl p I d* 1 1 t 11 leaves lanceolate strong y 3 5 ner ed spikes very small and few fld l p obtuse w tl sl ort intramarg nal lamella towards tl e middle t p shortly recurved *M q el Fl Jnl Bat*   747

MALAY PENINSULA on Mount Opl r *G ffit Lobb* —D STR B Jav

St m 18 n sl u r *Lea e* 6 8 by 1 1   ac   te s *C c re l go des Sp kes* ½ n lo   1 fld b ts 6 n abo t e p l g tl   ov ry flo ers g long stro ly e v   e s l ceol te a u   te 3 r d p t l f c tely g bbou ly lanceolate 1 2 n   l l p o ate s   ut   g s n l te tow rds tl e apex t p re urved —De cr d f om a s gle sp   n   Blu s figure represents the leaves shorter a d b oader and th sp k s   s   t   tl er no   flo rs n l term   l only

** *Flowers ı pe lu cle l sp ke*

4 **T Maingayi,** *H ok f*   spikes t rminal and ax llary bracts subulate l p with a med an and int amarg nal lamellæ exte d ng f om tl e base nearly to tl e acute t p

MALAY PENINSULA o Mount O l r *M   gay*

ble 1 18 n. *Le r s* 4 6 by   1 n el p t   lane ol te acum nate o n n l *Peduncle* 1½ n fl xuo s sl tl d   p k s ort bra ts very ar ll l w r 1½ n upp r sn al r flo ers   n lo g sep l obl n o   e sub   t lat ral 5 nerved dor al t rro   p als obl quely o long 3 4 n r el l p tl   r fl x t t p — Very l ke *T ped culata* Blun   of Su   a b   tl flowers ar r t f r furaceous the sepals are 5 ner   l and tl   ntramarg al lamel a of tl e l p a u cont nuous

5 **T Thwaitesii,** *Hook f*   sp ke terminal subcap tate   *b ts te*

subulate, lip ovate intramarginal lamellæ continuous to the base of the reflexed apex Cnemidia circuligoides, *Thwaites Enum* 315 (*not of Lindl*)

CEYLON, in hot dry places *Macrae, Thwaites*

Stem 6–12 in, slender *Leaves* 3 6 by $\frac{1}{3}$–$\frac{2}{3}$ in, narrowly linear-lanceolate, acuminate, 3 5 nerved *Peduncle* 1 in, naked, spike $\frac{1}{2}$ in, bracts rather longer than the smooth ovaries, flowers $\frac{1}{6}$–$\frac{1}{4}$ in long, sepals with very thick midnerves, dorsal oblong 3 nerved, lateral ovate lanceolate acuminate 5 nerved, petals oblong, obtuse, 3 nerved, lip rather thick

IMPERFECTLY KNOWN SPECIES.

CNEMIDIA BAMBUSÆFOLIA, *Thwaites Enum* 314, stem 2–3 ft, leaves few 6–8 by $1\frac{1}{2}$–$2\frac{1}{2}$ in elliptic-lanceolate caudate acuminate 5 nerved spike terminal sessile $\frac{3}{4}$ in long, bracts crowded lanceolate lower narrower $\frac{1}{2}$ in long

CEYLON, Suffragam district, *Thwaites* —Descript from Thwaites

TROPIDIA sp (*T curculigoides*, Kurz from the Andaman Islands), a small slender species, with lanceolate subacute 3 nerved leaves 2 3 by $\frac{1}{2}$–$\frac{2}{3}$ in

TROPIDIA sp, from Sikkim alt 1500 ft (*King in Herb Calcutt*) —Resembles *T curculigoides*, but is much larger, with 7 9 nerved leaves 7–11 in long by 2–$2\frac{1}{2}$ broad, and small fruit $\frac{1}{2}$ in long

79 PHYSURUS, *Richard*

Terrestrial, leafy herbs, stem below creeping, roots fibrous *Leaves* [illegible] *Flowers* small, spicate *Sepals* [illegible] petals *Lip* erect from the [illegible] spur exserted beyond the bases of the sepals *Column* very short, not appendaged in front, rostellum 2 fid, stigma anticous, prominent, anther erect, 2 celled, pollinia 2 clavate —Species about 20, Asiatic and American

1 **P. Blumei,** *Lindl in Wall Cat* 7397, *Gen & Sp Orchid* 504, *in Journ Linn Soc* i 181, bracts equalling the ovary, lip short, terminal lobe transversely oblong entire spur much shorter than the ovary 2 lobed *Thwaites Enum* 314 P humilis, *Blume Orchid Archip* t 27, f 2

SILHET, *Wallich* CEYLON, in the Central Province, *Macrae, &c* —DISTRIB Java

Stem 1–2 ft slender, glabrous below *Leaves* scattered $2\frac{1}{2}$–3 in, petioled, obliquely ovate or subcordate, acute, 3 nerved *Scape* pubescent, sheaths distant, finely acuminate, spike 2–5 in, villous, sepals $\frac{1}{3}$ in long brownish red obtuse, 1 nerved; petals spathulate, 1 nerved, lip white, contracted at the base of the terminal lobe, spur subcylindric or inflated, nerves strong hooked

2 **P. hirsutus,** *Lindl in Journ Linn Soc* i 180, tall, stout, villously hirsute, leaves ovate acuminate 7-nerved subglaucous beneath, base acute Goodyera hirsuta, *Griff Notul* iii 393, *Ic Plant. Asiat* t 347

[illegible] *Sepals, petals* and [illegible] tly known plant, of [illegible]

80 ANÆCTOCHILUS, *Blume*

Terrestrial herbs, stem below creeping *Leaves* petioled, ovate or lanceolate. *Flowers* in glandular-pubescent spikes *Sepals* free, dorsal

maller and forming a hood with the narrow acum nate petals lateral

tigmatic lobes lateral anther 2 celled pollinia narro ved into short or ong caudicles —Species 8 In lian and Malayan

* Cl t of l j deeply f n b iate

1 **A regalis,** *Bl m Orcl d lrcl p I d* 46 t 17 D spur as long as the sepals terminal obes of the lip short q adrate much shorter tl an tl e claw A setaceus *I dl i Bot R g* t 2010 *Ge i § Sp Orcl l* 199 *B t Mag* t o 08 *Fl les S r es* i t 1o Satyrium repens *Linn Sp Pl* 1339

CEYLON a cend ng to 3000 ft

Stem 6 10 n *Lea es* 1 1½ n ov te cor l te acute usually dark velvety green a d netted w th golden nerves *Scape* sto t or sle le sl c ths 2 sp ke

2 **A Roxburghii,** *I dl n Wall Cat* 7387 *Ge i & Sp Orcl l* 199 spur as long as the sepals t rmi al lobes of lip cuneately obovate as long as the claw *Fl e Orcl l Arcl p I l* o0 t 1 B f 2 Chrysobaphus Roxburgh *W ll l nt Fl* \ p t 27

TROPICAL H MALAYA f om S n a to Bhotan ASSAM S LHET and MUNNIPORE —D STRIB Ch n

Ve ne r *A r gal s* and le es s m rl; netted w th golden nerves and l as a var ety (ar β *L bb ana* B u ne l e) tl nearly vhole colou ed lea s h ch have a rosy d sk pa ng to yel o h h te

3 **A elatior,** *I ll n Jo r I n Soc* i 1 8 very tall spur of lip as long as tl e sepals base of cla v l astate term nal lobes of l p oblong shorter than the claw fringes very long

NILGHIRI H LLS ne r W lla (h ut *M I or*

Leaves 1½ n l am o b ula o ate sl ortly p t ole l *Scape* 12 in sp ke 3 4 fld bracts ½ broadly o ate l nceo ate flo e s n cl larger tl an n *A I or burgh i* l p ⅔ in lon f b æ l g pur fl te l t p s b cute emarg nate column larger w l a d dy ou larg l t l et bape l ppend ge n f o t roste u n long antl er large l ceo ate cum t Il e o m l le s a good d al fro n tl at of *r gal s* and *Roxburgl* Only o e spec ne s en

4 **A Reinwardtii,** *Bl e O l l Arcl p I l* 48 t 12 f 2 spur of l p nearly as long as the sepals terminal lobes of l p falcately oblong base of claw cordate fringes very long

PENANG on Go ernment H ll *Cu t* PERAK *Sc rtecl* on Maxwell s H ll *Wray* —D STRIB Sumat a

Lea es 1½ 2 n orb cular or ell i t c ovate netted w tl golde nerves or no *Scape* 4 6 n o ten very stout flo ers as n *A el or* column th a long process descend ng nto the spur

5 **A brevilabris,** *L idl Ge i § Sp Orcl d* 499 spur of lip saccate

much shorter than the sepals terminal lobes obtusely hatchet-shaped, claw of lip very short fringes few A albolineatus *Par & Reichb f in Trans Linn Soc* xxx 141 Dossinia marmorata, *Lindl in Journ Linn Soc* i 186 (*not of Morren*)

SIKKIM HIMALAYA (*Ic Cathcart* § *J D H*) KHASIA HILLS alt 4 5000 ft, *Mack* &c TENASSERIM *Parish*

Leaves ovate green with a white mesial band and golden nerves red beneath *Spikes* as in *A Lowii*, sepals and petals green tinged with pink, lip white, column very large with a forcipate appendage projecting from the base

** *Claw of lip entire or nearly so*

6 **A. Griffithii,** *Hook f Ic Plant ined*, claw of lip entire or with a membranous toothed margin and a trapeziform base, terminal lobes hatchet-shaped lobulate or toothed

EASTERN HIMALAYA *Griffith* Naga Hills, in UPPER ASSAM, *Prain*

Leaves 1½–1¾ in, orbicular ovate apiculate *Scape* 4–6 in, spike 10 20 fld, ... a broad folded ... ate 2 fid spur, toothed in the

7 **A. tetrapterus,** *Hook f Ic Plant ined*, claw of lip quite entire terminal lobes each 2 partite

Scape 2 in, and few fld ... arched, narrow, lobules ... oad auricles in front that terminate in a 2 fid membrane overhanging the mouth of the very short conical obtuse spur, anther lanceolate, acuminate

81 VRYDAGZYNEA, *Blume*

Terrestrial, leafy herbs, stem below creeping roots fibrous *Leaves* petioled, ovate *Flowers* small, spicate suberect *Sepals* subequal free, dorsal smaller forming a hood with the petals *Lip* included, sessile at the base of the column, membranous, concave, entire, spur large inflated, exserted beyond the base of the sepals with 2 stipitate calli within *Column* short, inappendiculate stigmatic lobes lateral rostellum short, anther short, cells distant pollinia 2 sessile on a large gland —Species 8–10, Indian, Malayan and Pacific

This genus is described as having two stipitate calli descending from the base of the column into the sac or spur of the lip, the stipites appear to me to be always more or less adnate to the walls of the sac, and represent two vascular bundles or nerves —The name is variously spelled All the species want revision and description from living plants

V. ...

LOWER BENGAL, Luckempore, on the Megna *Clarke* —DISTRIB ? Java

A span high *Leaves* 1½ 2 in, ovate to ovate lanceolate acute, membranous, shortly petioled *Scape* 1–1½ in, spike few-fld, rachis pubescent, bracts ½ in and

sheaths membranous, flowers 1/4 in long, pale yellow and pink, blade of lip as long as the oblong inflated spur, margins incurved —Only one specimen seen

2 **V. albida,** *Blume Orchid Archip Ind* 75, t 19, f 2, 3, bracts oblong subacute, lip oblong retuse with a short obtuse tooth disk with a low hispidulous ridge from the base to beyond the middle Etaria albida, *Blume Bijdr* 410, *Lindl. Gen & Sp Orchid* 491

ıg, ovate or elliptic,
membranous, spike
owers, sepals 1/8 in
ule 1/3 in long —The
A drawing apparently of this by Scortechini represents the leaves as more lanceolate with waved margins

3 **V gracilis,** *Blume Orchid Archip Ind* 72, t 17, and t 20, f 1, bracts lanceolate acuminate, lip oblong tip rounded apiculate, disk with a slender ridge from base to apex

PERAK, at Horum, *Scortechini* —DISTRIB Sumatra

Whole plant 3–8 in high, simple or branched glabrous *Leaves* 3/4 1 in, petioled, ovate or ovate-cordate, subacute *Scape* very short spike few fld papillose, sepals 1/6 in long acute, agglutinate to the narrow petals, spur obtuse, nearly as long as the blade of the lip, anther with a membranous tip

82 CYSTORCHIS, *Blume*

Characters of *Vrydagzynea*, but lip clawed as in *Zeuxine*, and with a large exposed didymous sac —Species 3 or 4, Malayan

Ætheria fusca Lindl referred here by Bentham is a true *Goodyera*, with the shallow sac of the lip partially exposed It must be by oversight that its habit is described as altogether that of *Cystorchis* from which it differs in its tufted roots, radical leaves robust habit, and alpine habitat Amongst Scortechini s drawings of Perak Orchids there are several probably referable to *Cystorchis*, but unaccompanied with specimens

1 **C. javanica,** *Blume Orchid Archip Ind* 87, t 24, f 1 leaves dark green with crenate pinkish margins, lip with a long straight claw and dilated tip Etaria javanica, *Blume Bijdr* 410, *Lindl Gen & Sp Orchid* 491 (*Ætheria*)

PERAK, *Scortechini* —DISTRIB Java

or subacute,
s lanceolate,
epals ovate
sac of lip
llum ovate,
—Specimen
e described

2 **C. variegata,** *Blume Orchid Archip Ind* 89, t 24, f 3 and 36 C, leaves pale green with dark transverse bands, scape slender, raceme puberulous, beak of lip with incurved sides and a small dilated tip

SINGAPORE, *Ridley* —DISTRIB Java

Leaves 2–2½ in, ovate-oblong or lanceolate acute, petiole ¾ in *Scape* with

raceme 4-6 in, glandular-pubescent, flowers about ¼ in long, lateral sepals very gibbous at the base —Named by Mr Ridley The flowers in the specimen he has kindly sent are far too young for analysis

83 HERPYSMA, Lindl

A terrestrial leafy herb, stem stout, erect *Leaves* ovate-lanceolate, petioled, membranous, sheaths very large, hyaline *Flowers* in a dense short sessile spike *Sepals* subequal free, dorsal forming a hood with the oblong petals *Lip* adnate to the sides of the column, spreading,

H. longicaulis, *Lindl in Wall Cat.* 7389, *in Bot Reg under* t 1618, *Gen & Sp Orchid* 506, *in Journ Linn Soc* i 178, 190

EASTERN HIMALAYA, Nepal, *Wallich* Sikkim, alt 3–4000 ft, *J D H*, &c KHASIA MTS, alt 4500 ft, *Clarke*

Stem 6–12 in, elongate and creeping below, then ascending, as thick as a swan's quill or less, clothed below with the white, truncate leaf sheaths ⅔ 1 in long *Leaves* 2-3 in, membranous, shortly petioled *Spike* 1–2 in, pubescent, bracts ⅓–⅔ in, ovate lanceolate, flowers with ovary rather longer, suberect, pale pink, sepals ½ in long, 5-nerved, and shorter petals obtuse, lip shorter than the sepals, subpanduriform, reflexed from the middle, strongly 5-nerved disk with 2 flattish calli about the middle, and a thick lamella extending to the rounded tip, spur longer than the blade, strongly nerved, base of white column contracted below the broad pulvinate stigma —I do not find the two lamellæ in the spur, which is longitudinally grooved or infolded at the back

84 ODONTOCHILUS, *Blume*

Habit and character of *Anæctochilus*, but sac or small spur of the lip hidden between the more or less connate bases of the lateral sepals — Species about 12, Indian, Malayan and Pacific

The pollen varies greatly in structure in this genus The species are most difficult of analysis and definition from dried specimens *Myrmechis* Blume, is only distinguishable by the fewer often erect flowers and stem with numerous small leaves

* *Stem stout, leafy Flowers solitary or very few* (MYRMECHIS, *Bl*)

1. O. macranthus, *Hook f Ic Pl ined*, leaves ovate acuminate, flowers very large solitary erect, claw of lip entire, margins involute, limb small orbicular

PERAK, *Scortechini*, on Maxwell's Hill, *Wray*

Stem 2-3 in, from a nodose procumbent base *Leaves* ¾ in, shortly petioled. *Flower* white, nearly 1 in long, with a sheathing bract on the very short peduncle; sepals erect, lateral linear-oblong from a gibbous base, 1-nerved, dorsal ovate lanceolate, long-acuminate; petals falcately dimidiate-ovate, long-pointed, sac of lip subglobose, enclosed calli small; limb shortly exserted, column very short, frontal appendage erect lanceolate, rostellar arms very long, slender; anther linear-lanceolate, pollinia clavate, united caudicles long slender, gland elongate —Resembles *Myrmechis glabra*, Blume of Java, but the narrower flowers, long anther, pollen and rostellar arms at once distinguish it

2 **O. calcaratus,** *Hook f Ic Plant ined*, leaves very small ovate acuminate, flowers 1-3, claw of lip crenate, lobes small quadrate or rounded column with a linear process descending into the cylindric or incurved spur

PERAK *Scortechini*, alt 3000 ft, *Wray*

Stem 3 5 in, slender, flexuous, leafy *Leaves* $\frac{1}{4}$-$\frac{1}{3}$ in, sessile or petioled, aristately acuminate *Peduncle* very short, and bracts lanceolate, quite glabrous, flowers white, sepals linear, 1-nerved, lateral with the outer bases connate and enclosing the spur, petals linear-lanceolate, 1 nerved, lip $\frac{1}{3}$ in long spur half as long as the sepals, with a columnar caruncle enclosed, tip straight or incurved, [illegible] -lanceolate, pollinia short, [illegible] Wray describes the leaves as [illegible] red with red, the flowers pale carnation, lip white

3 **O. pumilus,** *Hook f Ic Plant ined*, leaves $\frac{1}{3}$-$\frac{1}{2}$ in scattered petioled ovate, scape 1-5 fld bracts oblong ciliate, lateral sepals ovate subacute, claw of lip crenulate terminal lobes subquadrate Cheirostylis pusilla, *in part*, *Lindl in Journ Linn Soc* i 188 (*not of Gen & Sp Orchid*)

SIKKIM HIMALAYA, alt 8-10 000 ft, *J D H*, *Thomson King*

Stem with scape 2-3 in, ascending from a prostrate base stout for the size of the plant *Leaves* acute, rather thick, nerves obscure, sheaths very short *Scape* with one membranous ciliate sheath, flowers subglobose $\frac{1}{4}$ in diam white, dorsal sepal broadly ovate with an obtuse recurved tip 1 nerved lateral triangular-ovate, very oblique at the base, 1 nerved, sac of lip simple, internal calli very large, terminal lobes shortly exserted, thick —So like *Cheirostylis pusilla* that it was confounded with it by Lindley The specimens I have seen are very few, and the flowers very difficult of analysis

** *Stem elongate Leaves* 1 *in or more long Spikes few or many fld* (ODONTOCHILUS, *Bl*)

4 **O. crispus,** *Hook f*, leaves few ovate acute, bracts shorter than the glabrous ovary, claw of 2 winged lip quite entire, wings toothed much larger than the sepals Anœctochilus crispus, *Lindl in Journ Linn, Soc* i 180

SIKKIM HIMALAYA, alt 5-6000 ft, *Ic Cathcart Clarke* KHASIA HILLS; at Sururcem, alt 5000 ft, *Clarke*

Stem slender, elongate below the 2 4 leaves *Leaves* $\frac{3}{4}$ in petiole $\frac{1}{2}$-1 in [illegible] 4 8-fld, rachis and ovate lanceolate bracts pubescent lateral sepals $\frac{1}{4}$ in [illegible] dorsal much smaller petals dimidiate-ovate falcate acuminate claw of lip [illegible] ing the sepals slender, 2 winged limb $\frac{1}{2}$ in diam white, sac minute, [illegible] enclosed caruncles large, column and rostellar arms very short indeed, anther [illegible] short, tip recurved, pollinia globose, sessile at the truncate end of the [illegible] fleshy ? cuneiform caudicle, gland minute —A Sikkim specimen of Clarke's [illegible] this has pubescent sepals, and a few minute tubercles on the claw of the lip

5 **O. pectinatus,** *Hook f Ic Plant ined* stem leafy, [illegible] acute, spike few fld laxly villous, bracts as long as the ovary, [illegible] pectinate, limb linear or broadly 2 winged, sac globose, [illegible] long

PERAK, alt 3-4000 ft, *King's Collector*, Maxwell's Hill *Wray*

Stem 6-12 in *Leaves* $1\frac{1}{2}$-$2\frac{1}{2}$ in, light green, thick, fleshy, peti[illegible]

shorter than their broad thick coherent caudicles

6 **O. brevistylis,** *Hook f Ic Plant ined*, leaves towards the top of the stem obliquely ovate lanceolate acute spike few-fld pubescent, bracts as long as the ovary, claw of lip slender with few curved spinous teeth, sac globose, limb bipartite, segments semicircular, rostellar arms very short

PERAK, on Gunong Batu Pateh, alt 3400 ft, *Wray*

A span high *Leaves* 1½-2 in pale green, petiole ½ in *Spike* short, flowers white, ovary glabrous, sepals ½ in long lateral broadly obliquely ovate, acute, hairy dorsal much smaller, petals semicircular with long points, sac of lip with 2 large caruncles, claw narrow, limb larger than the sepals, column exceedingly short, frontal appendages obscure, rostellar arms triangular, subacute, anther short, ovate, obtuse, pollinia subglobose, sessile on the truncate base of the united caudicles which form a large fleshy triangular plate acute at the top, gland minute —The pollinia and their caudicle are a good deal like those of *O crispus*

7 **O. Elwesii,** *Clarke mss*, stem above and few fld spike hirsute, ... ovary, sepals ... lobes of limb ... *Hook f Ic*

SIKKIM HIMALAYA alt 4 6000 ft, *Clarke, King* KHASIA HILLS, on Shillong, alt 6100 ft *Clarke* MUNNIPORE, on Kohima *Prain*

Stem stout below 6-8 in high *Leaves* 1½-2 in, rather crowded, dark green with 3 red nerves *Spike* 2 4 fld lateral sepals ovate acuminate 1 nerved green purpl tipped or white dorsal much smaller, petals semicircular, with long or short points, sac of lip 2 lobed, claw dark purple centre and subquadrate lobes white, column very short frontal appendages triangular anther short, apiculate, connective very thick pollinia broadly clavate grains flat, caudicles 0 gland linear — This and *O grandiflorus* have lamellate ecaudiculate pollen

8 **O. grandiflorus,** *Benth in Gen Plant* iii 598, tall, leafy, leaves 3-5 in obliquely elliptic acute, spike stout many fld, rachis pubescent bracts about equalling the glabrous ovary, sepals glabrous, spur of lip decurrent on the ovary claw with 5-6 pair of long recurved spines, wings large cuneate, anther lanceolate pollinia clavate grains lamellate Anœctochilus grandiflorus, *Lindl in Journ Linn Soc* i 179

SIKKIM HIMALAYA, alt 4 6000 ft, *J D H* KHASIA HILLS, alt 4000 ft *J D H* & *T T*

Stem with spike 12 15 in as thick as a goose-quill below *Leaves* 2 2½ in diam ... acute or rounded, petiole 1½ 2 in *Spike* 4 6 in ; bracts ½ in, pink, ... lanceolate, subacute, connate ... petals mottled with pinkish ... lip rather long callus within ... than in its congeners, with 2 ascending frontal wings; rostellum very broad 2-cuspidate, pollinia lamellate, without caudicles narrowed upwards, the narrowed portion lamellate down to the small gland

9 **O. Clarkei,** *Hook f Ic Plant ined* tall leaves 2-2½ in obliquely elliptic acute spike subtomentose many fld, bracts longer than the

pubescent ovary, sepals glabrous lateral free at the base, sac of lip small globose didymous claw with broad round auricles at the base and 2-3 pair of spines, wings hatchet shaped anther elongate, pollinia subglobose with a long flexuous thick caudicle grains cuneiform

SIKKIM HIMALAYA, Mongpo alt 3000 ft, *Clarke*

A foot high including the spike *Leaves* as in *grandiflorus*, but much smaller *Spike* 5 in, very many fld, bracts ½ in, pink, pubescent, lateral sepals ⅓ in, broadly ovate-oblong, pink, 1 nerved, dorsal and petals concerent in a small deeply cordate pink cuspidate hood, sac of lip with 2 caruncles, claw expanding just beyond the sac into an orbicular or obcordate plate, wings as large as the sepals; column with 2 ascending frontal appendages, rostellum broad, bifid, long caudicle of the pollinia rather stout golden, gland small —The only species with a dilated base of the claw of the lip The specimen is a solitary one

10 **O. lanceolatus,** *Benth in Gen Plant* iii 598, leaves 2-3 in

luteus, *Lindl in Journ Linn Soc l c*

SIKKIM HIMALAYA, alt 5-6000 ft, *Griffith's Collectors* (*Kew Distrib* 5345, 5354), &c KHASIA MTS, *Mack*, *Griffith* (*Kew Distrib* 5352) &c

Stem with the spike 6-8 in, few or many leaved *Leaves* green *Spike* 2-3 in, bracts ¼-½ in, usually broader and whiter than in other species, nearly glabrous,

flowers

85 HAEMARIA, *Lindl*

Terrestrial herbs, caudex creeping *Leaves* petioled *Flowers* racemed ...hood with the petals, lateral ...e and sides of the column, ...aled by the sepals, sides ..., sac with 2 large internal ...ticous, anther large, sub...ulate, granular, attached ... Species 4, Malayan and Chinese

H. discolor, *Lindl Gen & Sp Orchid* 490, *Miq Choix Pl* t 16 Ludisia discolor, *A Rich in Dict Class Hist Nat* vii 457, *Blume Orchid Archip Ind* 113, 114, t 34, f 2, 3, and t 42 Goodyera discolor, *Ker in Bot Reg* t 271, *Bot Mag* t 2055, *Lodd Bot Cab* t 143 Myoda rufescens, *Lindl in Wall Cat* 7390, *Gen & Sp Orchid* 489

MALAY PENINSULA, at Johore, *Ridley* PENANG, *Wallich* —DISTRIB. Hong Kong, Cochin China.

Caudex very short *Stem* ascending from the base, 6–10 in, stout or slender ulate, bracts petals sepals with s var

Dawsoniana from Moulmein (Trans Linn Soc xxv 142) consists of leaves only and is probably an *Anæctochilus*, it may or may not be his var *Dawsonianus*, Gard Chron 1872 321 (*Anectochilus Dawsonianus*, Low in Gard Chron 1868, 1038) with red reticulations on the leaves

86 DOSSINIA, *Morr*

A Bornean genus, not hitherto found in British India The plant referred to it by Lindley is *Anæctochilus brevilabris* (see p 95)

87 SPIRANTHES, *Rich*

Terrestrial herbs roots fibrous or tuberous, stem leafy, or the flowering leafless *Leaves* various *Flowers* small, secund, in often twisted spikes *Sepals* subequal free, or more or less cohering with the petals in an erect hood, lateral gibbous at the base *Lip* sessile or clawed erect, entire or 3 lobed base concave disk callous or lamellate *Column* short, terete, base often decurrent on the ovary, stigma anticous broad, rostellum erect obtuse or elongate and 2-fid, anther erect, 2 celled, pollinia pendulous from the gland of the rostellum —Species about 80, temperate and tropical

[illegible]

[illegible] *Gyrostachys australis* *Blume Fl Jav* 107, t 37, 38— Spiranthes *Griff Notul* iii 384 *Ic Plant Asiat* t 318

[illegible] W TIBET to UPPER ASSAM and southing to 7500 ft in the Sikkim Himalaya, [illegible]ganistan, N Asia, China, Java, Australia, [illegible]

Plant 6 18 in high stout or slender, sometimes almost tuberous *Leaves* 1–5 in, very variable rarely oblong and sessile often scattered and lower long petioled, sheaths rather [illegible] flowers secund close set, sepals obtuse, tips (and of the size of the flowers of the same areas

VAR *Wightiana*, Lindl Gen & Sp 465; very stout, sheaths many almost

imbricating, flowers in a dense cylindric spike S Wightiana, *Lindl in Wall Cat.* 7378 S densa, *A Rich in Ann Sc Nat Ser* 2, xv 79 S australis, *Wight Ic* t. 1724 (*left-hand fig*) —Nilghiri Mts

oblong pandurform glabrous, base 2 glandular *Lindl Gen & Sp. Orchid* 469, *in Journ Linn Soc* i 277, *Boiss Fl Orient* v 90, *Reichb Fl* t 47

WESTERN HIMALAYA, at Lohoo Ghat, *Thomson* (Fl May) —DISTRIB Affghanistan, Caucasus to the Atlantic

Root of 2 fleshy fusiform or subcylindric tubers ½ 1½ in long *Leaves* 1–1½ in, on a very short lateral stem that flowers in the following year *Scape* with the rather stout raceme 4–6 in, spike twisted, flowers secund greenish white, variable in size, usually larger than in *S australis* —This common European species has not been recorded from any locality between the Caucasus and Affghanistan Boissier errs in describing the tubers as napiform In Europe it flowers in October to December, in India and Affghanistan in April and May

88 NEOTTIA, *Linn*

Terrestrial erect brown leafless herbs, rootstock with fibres, stem simple laxly sheathed *Flowers* racemose *Sepals* subequal, free, lanceolate, concave at length spreading, lateral falcate *Petals* narrow *Lip* pendulous fro

concave

erect or ii

masses, pe

Europe and Asia

NEOTTIA STRATEUMATICA, Br Prodr 319 (in note) In a note under *Neottia australis*, Brown refers the *Orchis strateumatica* of Linnæus (Flor Zeylan n 319, *Sp Plant* 1 i 943) to *Spiranthes*, on the faith of a specimen in Hermann's Herbarium, but Linnæus character of "spur slender as long as the ovary" is quite opposed to this determination I do not know what it is

N. listeroides, *Lindl in Royle Ill* 368 *Gen & Sp Orchid* 458, *in Journ Linn Soc* i 176 N Lindleyana, *Dcne in Jacquem Voy, Bot* 163, t 163

TEMPERATE HIMALAYA, from Kashmir eastwards to Sikkim alt 5–10,000 ft

exuous, sheaths 3–4, in sheathing membrown, sepals trun- 2–3 times as long as parallel lobes from pubescent *Capsule*

½ in long, ellipsoid, erect

89 LISTERA. *Br*

Terrestrial erect 2 leaved herbs, with fibrous roots from a short rootstock *Leaves* broad, subopposite *Flowers* rather small, racemed *Sepals* and *petals* subequal, free, spreading or reflexed *Lip* pendulous from the base of the column, usually longer than the sepals narrow, entire or 2-fid

Column stout rostellum terminal, anther inclined forwards cells 2 contiguous, pollinia 2, usually 2 partite, pendulous from the gland of the rostellum —Species 10, N temperate regions

1 **L. ovata,** *Br in Hort Kew*, v 201, leaves ovate, lip linear 2 fid *Lindl Gen & Sp Orchid* 155, *Boiss Fl Orient* iv 92, *Ledeb Fl Ross* iv 80, *Reichb. Ic Fl Germ* xiii t 479

NORTH WEST HIMALAYA?, *Falconer* —DISTRIB Europe to the Ural and the Caucasus

Whole plant 12–18 in high *Root* of fleshy fibres *Stem* 2–4 in naked *Leaves* 2–4 in sessile subacute *Scape* with raceme 6–10 in, with 1–2 small sheaths, ra
$\frac{1}{12}$–$\frac{1}{8}$ in, fl
as the sepal
is the only
been found
been inadvertently placed by him in his Indian Herbarium

2 **L. tenuis,** *Lindl in Journ Linn Soc* i 176, leaves ovate acute, lip cuneately obcordate

½
lon
as

3 **L. pinetorum,** *Lindl in Journ Linn Soc* i. 175, leaves orbicular cordate acute, lip cuneately broadly obcordate from a narrow base, lobes broad

SIKKIM HIMALAYA in pine woods of the Lachen valley, alt 10 11 000 ft, *J D H*, Chumbi *King's Collector*

Whole plant 4–8 in high slender *Leaves* 1–1¼ in, much nearer the raceme than the root about as broad as long very shallowly cordate 5–7 nerved *Scape* rather stout, very short and few fl raceme pubescent, bracts appressed to the scape, ovate, acuminate herbaceous flowers decurved ½ in long greenish brown, lip twice or thrice as long as the sepals, deeply 2 lobed, sinus obtuse, column long, incurved

4 **L. micrantha,** *Lindl in Journ Linn Soc* i 176, leaves sub radical broadly ovate, lip 3 lobed short

90 CHEIROSTYLIS, *Blume*

Terrestrial herbs *Leaves* membranous *Flowers* small, racemed *Sepals* connate in a gibbous based tube to the middle *Petals* narrow, *Lip* inserted at the base of the column erect, narrow, base saccate, limb shortly clawed broadly dilated entire toothed or crenate *Column* short with 2 appendages in front rostellum 2 cleft, stigmatic lobes lateral, anther erect cells short, pollinia 2, caudicle short, gland oblong —Species about 8, Indian and Malayan

* *Appendages of column as long as the rostellum*

1 **C. pusilla,** *Lindl Gen & Sp Orchid* 489, *in Journ Linn Soc* iii 188 (*in part*), glabrous, leaves very small ovate, raceme 2–3 fld limb of lip 2 lobed, lobes quadrate deeply toothed Etaeria pusilla *Wall Cat* 7392 Zeuxine moniliformis, *Griff Notul* iii 397, *Ic Plant Asiat* t 350

KHASIA HILLS alt 4–5000 ft, *Wallich* &c

Stem 3–6 in prostrate below, often moniliform from the swollen internodes ... petiole short *Scape* 1 3 in, ... inclined ½ in long, sepals ... tly saccate, nerves with a few ... , columnar appendages fleshy as long as the rostellar arms anther lanceolate, pollinia pyriform gland very long —Closely resembles *Odontochilus pumilus* and was confounded with it by Lindley

2 **C. malleifera,** *Parish & Reichb f in Trans Linn Soc* xxx 141, glabrous, leaves very small ovate acute, raceme 3–5 fld, lobes of lip entire

TENASSERIM, on Zwakabin *Parish*

Very like *C pusilla*, but there is no appearance in the specimens of a monil form stem, leaves rather larger, flowers not half the size lip with a longer and shallower base, and quite entire somewhat hatchet shaped lobes, anther with a dilated membranous apex

3 **C. Griffithii,** *Lindl in Journ Linn Soc* i 188, scape pubescent, flowers 1–3 large limb of lip reniform laciniate appendages of column linear. Goodyera No 9 *Griff Notul* iii 393

KHASIA HILLS alt 4–5000 ft *Griffith Lobb Clarke* PEGU *Kurz* (in Herb Calcutt) TENASSERIM on Mt Taigoo *Parish*

Stem below prostrate *Leaves* 1 in shortly petioled ovate acuminate, sheaths very large cupular, hyaline *Scape* 3–8 in slender, sheaths and bracts large, loose, lanceolate flowers nearly 1 in long with the ovary white with 2 green spots on the lip sepals connate to the middle, petals narrowly spathulate, base of lip *elongate, concave, with 2 series of glandular setæ within, claw short* *Capsule* ⅜ in, pedicelled, pyriform

4 **C. parvifolia,** *Lindl in Bot Reg* 1839 *Misc* 19 *Gen & Sp Orchid* 488, *in Journ Linn Soc* i 187 raceme puberulous ... flowers minute, limb of lip subquadrate 6–8 lobed appendages of the column dilated upwards rather short *Thwaites Enum* 313

CEYLON, Ambagamowa district rare *Thwaites*

A span high *Leaves* 2–3 about the middle of the slender stem ... lanceolate, acuminate *Scape* slender pub rulous raceme 8–10 fl ...

** *Appendages of column shorter than the short ... as long*

5 **C. flabellata,** *Wight Ic* v 16 scape glandular ... subcorymbose, limb of lip suborbicular deeply ...

appendages of column subspathulate, *Lindl in Journ Linn Soc* i 187, *Thwaites Enum* 313 (*excl in both Syn Zeuxine*), *Dalz in Hook Journ Bot* iv (1852) 112 *Dalz & Gibs Bomb Fl* 271 Monochilus flabellatus, *Wight Ic* t 1727 Goodyera flabellata *A Rich in Ann Sc Nat Ser* 2, xv 79, t 12

BHOTAN HIMALAYA *Griffith* TENASSERIM *Parish* The CONCAN, *Dalzel* NILGHIRI HILLS alt 6000 ft, *Wight &c* CEYLON, Ambagamowa district, *Thwaites Beckett*

column very short, appendages subterminal and rostellar arms both subspathulate anther with a dilated membranous tip pollinia pyriform, subsessile on the elongate lanceolate gland

6 **C. pubescens,** *Parish & Reichb f in Trans Linn Soc* xxx 141, scape pubescent limb of lip 2 lobed lobes subquadrate crenate appendages of the column cuneately obovate much shorter than the subspathulate arms of the rostellum

pet
per
bas
Capsule ½ in pyriform pedicelled

91 ZEUXINE, *Lindl*

analysis in dried specimens, that much allowance must be made for my description of it

Sect 1 EUZEUXINE, *Lindl* *Leaves* sessile, linear lanceolate

18
In
W

in Journ Linn Soc l c, *Blume Orchid Archip Ind* 68 Z Tripleura, *Lindl in Journ Linn Soc l c* Z integerrima, *Lindl Gen & Sp* 486,

Blume Fl Jav. 55, t 19 and 23 C, *Orchid Archip. Ind* 67, *Miquel l c*
Z procumbens, *Blume Fl Jav* 56,
Ind 68 Tripleura pallida, *Lindl*.
lenostylis emarginata & integerrima,
sulcatum, *Roxb Fl Ind* iii 452
Corycium ? humile, *Herb Ham*

Throughout INDIA, in the plains and lower hills, from the Panjab and Scinde to ASSAM, CHITTAGONG, and southward to CEYLON —DISTRIB Affghanistan, Java, China, Philippines

Stem 2-16 in, erect, glabrous, leafy to the top *Leaves* few or many, 1 2 in, erect, acuminate, margins usually recurved *Spike* ½ 2 in, dense fld, nearly glabrous, bracts ¼–½ in, erect, lanceolate, acuminate, hyaline, 1 nerved, flowers white, yellow, or very pale rose, sepals ⅛ in long oblong, obtuse, membranous, petals oblong, obtuse, hyaline, lip yellow equalling the sepals, cymbiform, contracted into a short pubescent claw bearing a hammer headed terminal lobe or 2 small lobes, column short, rostellum short, anther short, ovate, pollinia pyriform, attached within the tip of a linear appendage of the gland *Capsule* ¼ in long, ellipsoid —The commonest Indian Orchid, very variable in size The tall form, *Z membranacea*, has large flowers, and may prove distinct, but there appears to be many intermediate forms

Sect 2 MONOCHILUS, *Wall* (Gen) *Leaves* ovate —All scapigerous

* Claw of terminal lobes short with involute margins

† *Terminal lobe of lip very small, entire or subentire*

2 **Z. goodyeroides,** *Lindl Gen & Sp Orchid* 486, leaves ovate green with a median pale stripe, spike nearly glabrous, lip cymbiform terminal lobe orbicular or oblong concave membranous Monochilus galeatus, *Lindl in Journ Linn Soc* i 187

EASTERN HIMALAYA, from Sikkim, alt 6–8000 ft, to Mishmi, *Griffith*, &c PEGU, *Kurz in Herb Calcutt*

Stem 2 4 in *Leaves* 1–1½ in, sessile or shortly petioled obtuse acute or acuminate, sheaths short *Scape* 3–6 in, slender, spike lax fld, bracts equalling the glabrous ovary, sepals ⅓ in long, dorsal ovate, acute, lateral lanceolate 1 nerved, petals falcate, very obtuse, lip wholly included coriaceous, with 2 short spurs within, rostellar arms small, stigmatic lobes distant, pollinia pyriform, attached by a slender caudicle to the oblong gland

3 **Z. reniformis,** *Hook f Ic Plant ined*, leaves approximate ovate lanceolate acuminate, scape short pubescent, bracts longer than the pubescent ovary, sepals ovate 3 nerved subacute glabrous, lip included, sac hemispheric with 2 toothed calli within terminal lobe reniform crenate

PERAK, *Scortechini*

Stem 6–10 in below the leaves *Leaves* 2 3½ in membranous base rounded, petiole ½ in, slender, sheath short inflated *Scape* 2 in, spike about as long, bracts ½ in, lanceolate, hyaline, sepals ¼ in long, membranous ovate obtuse, 3 nerved, petals ¼ in, orbicular long-beaked 3 nerved, limb of lip with 2 small appendages at the base, column 2 winged in front, rostellar arms long, fleshy, trumpet shaped, anther lanceolate pollinia pyriform attached separately to the face of a large cuneately quadrate horny appendage which is continuous with the triangular gland, margin of gland and appendage recurved

†† *Terminal lobe of lip 2 winged*

4 **Z. longilabris,** *Benth in Gen Plant* iii 600, spike pubescent,

lip much longer than the sepals, wings of terminal lobe elongate toothed Monochilus longilabre, *Lindl Gen & Sp Orchid* 487, *in Journ Linn Soc.* i 186. M affinis, *Wight Ic* t 1728 (*not of Lindl*)

ASSAM LOWER BENGAL and CHITTAGONG, *Clarke* WESTERN GHATS, in the S Concan, *Stocks*, and Travancore, *Wight* CEYLON, in the drier parts of the island, *Macrae*, *Thwaites*

Leaves 1 1½ in, near the base of the short stem, shortly petioled *Scape* very

of the gland

5 **Z. regia,** *Benth in Gen Plant* iii 600, leaves ovate lanceolate with a median pale stripe acute, spike pubescent, sepals and petals with recurved tips, lip rather longer than the sepals, wings suborbicular or cuneiform Monochilus regium, *Lindl Gen & Sp Orchid* 487

CEYLON, damp woods in the Central Province, ascending to 4000 ft, *Macrae*, &c

Stem slender, elongate *Leaves* 1½ 2½ in dark green variable in breadth, petiole and sheath short *Scape* 3 5 in spike few fld, bracts as long as the ovary, sepals ⅓ in long, very obtuse, lip with a short saccate base, anther broadly ovate, beaked, pollinia clavate, pendulous from the small oblong gland, appendages 0

6 **Z. nervosa,** *Benth in Gen Plant* iii 600, leaves broadly ovate

, lip rather longer

m, *Wall in Lindl*

Etæria nervosa,

SIKKIM HIMALAYA, alt 2-4000 ft, *J D H.* SILHET, *Wallich* CACHAR, *Keenan* BENGAL, at Comilla, &c, *Clarke*

Stem rather stout *Leaves* 1-2 in *Scape* 2-5 in, stout or slender, spike 1-8 in, lax or dense-fld, bracts equalling the ovary; sepals ¼ in or less, green or purplish, anther didymous, apiculate, pollinia and their appendages as in *Z reniformis* —The Ceylon habitat cited by Thwaites is an error

7. **Z. flava,** *Benth in Gen Plant* iii 600, leaves ovate acute, spike glabrous or pubescent, flowers very small, lip shorter than the sepals, wings broadly obovate or hatchet-shaped Monochilus flavum, *Wall in Lindl Gen & Sp Orchid* 487, *in Journ Linn Soc* i 187 Etæria flava, *Lindl in Wall Cat* 7380 A, B

NEPAL, *Wallich* ASSAM, *Griffith*, on the Naga hills, *Prain* TENASSERIM, *Helfer*, *Griffith* CEYLON, Central Province, alt 3000 ft, *Thwaites*—DISTRIB Java, Borneo

Stem usually elongate,
not, sheath usually much
1-1¼ in, lax fld, bracts
included, sac with 2 l
subglobose, attached by a
fld species A drawing
a red lip

8 **Z. affinis,** *Benth in Gen Plant* iii 600, leaves ovate or ovate-lanceolate, spike and ovaries pubescent, lip longer than the sepals, wings

obovate-oblong or subcuneate Monochilus affine, *Lindl Gen & Sp Orchid* 487 (*excl hab Courtallum*) Etæria affinis, *Lindl in Wall Cat.* 7383 E flava *Wall Cat* 7380 C Ætheria mollis, *Lindl. in Journ Linn Soc* i 184

SIKKIM HIMALAYA, in the Terai, *Gamble* KHASIA HILLS, alt 5000 ft, *Griffith*, &c. BURMA, at Taong Dong, *Wallich* TENASSERIM, at Moulmein, *Lobb*, *Parish* PENANG, *Maingay*

Very like *Z flava*, but the flowers are much larger, and much more numerous, the sepals ¼ in long, and the pollinia are pyriform, attached by an elastic caudicle to the oblong gland

9 **Z. abbreviata,** *Hook f*, leaves lanceolate acuminate, bracts ovate lanceolate shorter than the slender erect glabrous ovaries, sac of lip with 2 lamellæ on the midrib and 2 large calli on each side, wings of terminal lobe obliquely ovate subacute entire Etæria abbreviata, *Lindl in Wall Cat* 7385, *Gen & Sp Orchid* 491 (Ætheria) E lanceolata, *Reichb f in Trans Linn Soc* xxx 142 Dossinia lanceolata, *Lindl in Journ Linn Soc* iii 186

NEPAL, *Wallich* KHASIA HILLS, alt 4–5000 ft, *J D H & T T*

Whole plant 1 ft *Leaves* 2½ in, many nerved, petiole ¼ ⅔ in *Spike* puberulous, sepals pink, broadly ovate, acuminate, petals semi orbicular or lunate, column with 2 membranous wings on the face, rostellum very short 2 fid, anther ovate, obtuse, pollinia elongate, clavate, lamellate down to the large gland

** Claw of terminal lobe of lip slender, not margined

10 **Z. moulmeinensis,** *Hook f*, slender, leaves elliptic, spike glandular-pubescent few fld bracts ovate lanceolate shorter than the

TENASSERIM at Moulmein *Lobb Parish*

Stem slender with the spike 12 18 in *Leaves* 2–3 in, elliptic, acute or acuminate, membranous, petiole 1 in slender *Spike* 2–3 in, few fld, flowers not secund, spreading, ovary slender ½ in long sepals membranous, 1 nerved, dorsal ovate, lateral much broader petals broadly dimidiate ovate with recurved points, sac of lip with caruncled callous s des sub- 4 celled by imperfect transverse and longitudinal septa claw slender p ibescent, lobes divaricate as long as the rest of the lip, column very short and stout with projecting cheeks on the anterior face, rostellum short, 2-fid, anther short ovate obtuse, pollinia pyriform, attached to the gland by very short caudicles —Possibly a *Cystorchis*

11 **Z. longifolia,** *Hook f*, tall, very robust, leaves large lanceolate acuminate, spike elongate laxly many fld, rachis puberulous bracts

Lindl in Journ Linn Soc i 181

SIKKIM HIMALAYA, in lower valleys, *J D H*

Stem procumbent at the base, as thick as a swan's quill, branched *Leaves* 6–8 by 1½–2 in, many-nerved, midrib stout, petiole 1–1½ in, sheaths short. *Spike* 7 in, flowers very obliquely gibbous, not secund, bracts ovate-lanceolate, ovary

very singular plant

92 HYLOPHILA, *Lindl*

Terrestrial herbs stem elongate, creeping *Leaves* petioled, obliquely ovate-lanceolate *Flowers* small, spicate subglobose, perianth horizontal, connivent *Sepals* acuminate dorsal with the petals forming a hood, lateral very broadly ovate, concave *Petals* falcate or subspathulate *Lip* a subglobose sac contracted at the mouth with a very small linear blade and 2 glands within near the base *Column* very short appendages 0 or minute, stigma prominent, frontal under the very long forked rostellum, anther elongate, cells short, pollinia shortly caudicled —Species 2, Malayan

1 **H. mollis,** *Lindl in Wall Cat* 7396 *Gen & Sp Orchid* 490, leaves flat acuminate bracts subulate sepals ⅛ in long pubescent *Blume Orchid Archip Ind* 115, t 35, 36 F

SINGAPORE, *Wallich* MALACCA, *Griffith* (*Kew Distrib* 5337) PERAK, *Scortechini* —DISTRIB Sumatra.

Caudex flexuous, roots very thick *Leaves* 3 4 in, black when dry, base unequal, acute *Scape* 8–12 in, very slender, sheaths ½ in, scattered, subulate, spike 4–6 in, bracts ⅓ in, equalling the flowers sepals 3 nerved; petals falcately lanceolate, acute

2 **H. lanceolata,** *Hook f*, leaves caudate acuminate, margins waved bracts lanceolate, sepals ¼ in long nearly glabrous Dicerostylis lanceolata, *Blume Orchid Archip Ind* 116, t 38, f 1

PERAK, *Scortechini* —DISTRIB Java

A much stouter plant than *H mollis*, leaves larger, 4–5 in, petiole 1 in, red brown when dry, scape in the only specimen seen much shorter and stouter, bracts broader and more concave, flowers twice as large, ovary twisted, sepals 5 nerved, petals dimidiately obovate, 3 nerved *Column* with a minute subulate process on each side below the stigma

93 GOODYERA, *Br.*

Terrestrial leafy herbs, stem short, or elongate and creeping below *Leaves* subradical, petioled *Flowers* small, in often twisted spikes *Sepals*

Mascarene Islands

* *Stem* tall, stout, 18 in –2 ft *Leaves* large, suberect, petioled, lanceolate or elliptic lanceolate acuminate —The species of this group are not allied *inter se*, agreeing only in stature

1 **G. procera,** *Hook Exot Flor* t 39, spike dense fld, flowers minute lip saccate softly setose within and with 2 large calli within the obtuse recurved tip, column very short, anther obtuse *Lindl Gen & Sp Orchid* 493, *in Journ Linn Soc* i 183, *Don Prodr* 28, *Wight Ic* t 1729 G carnea *A Rich in Ann Sc Nat Ser* 2, xv 80 Cionisaccus lanceolatus, *Breda Orch Kuhl et Hassk t* 1 Cordylestylis foliosa, *Falconer in Hook Journ Bot* iv (1842) 75 Neottia procera, *Ker in Bot Reg* t 639—Leucostachys *Hoffman Preisser Orch* 1842, *ex Linnea*, xvi, *Littlb* 234

TROPICAL HIMALAYA alt 1 3000 ft from Garwhal to Upper Assam, the KHASIA and NAGA HILLS, and PEGU NILGHIRI HILLS and MALABAR GHATS, *Wight* CEYLON, ascending to 4000 ft —DISTRIB Java China

Root of thick tufted fibres *Stem* 10–30 in usually many leaved *Leaves* 4–8 by 1–2 in, thick, petiole very stout *Spike* 3 8 in, rachis glabrous or pubescent, bracts equalling the subglobose whitish fragrant flowers which are ⅛ in diam, sepals broadly ovate, obtuse 1 nerved petals spathulate, lip not longer than the column, pollinia broadly pyriform, sessile on the gland *Capsule* ⅓ in fusiform

2 **G. rubens,** *Blume Orchid Archip Ind* t 9 C, D spike rather lax fld, lip saccate beaked densely clothed within with soft tubercles or short setæ column long slender, anther lanceolate, pollinia powdery narrowed into one slender caudicle

PERAK upper part of the Litang Padang Valley alt 2000 ft *Wray*—

v not covering the sac of the
in front rostellar arms large,
dicles of pollinia as long as the
sac of the lip of *Cystorchis*,
but all other characters of *Goodyera* except the very long column

3 **G. fumata,** *Thwaites Enum* 314, spike rather lax fld, lip concave rhomboidly orbicular caudate acuminate glandular within column clavate, anther ovate subacute

CEYLON, in the Central Province rare *Thwaites*

Three feet high and very stout *Leaves* many 6–10 by 3–4 in obliquely elliptic lanceolate, petiole 2 4 in stout *Scape* stout and spike glandular pubescent,
metimes elongate,
eolate acuminate,
ed into a revolute

** *Stem* 1–8 in, rarely more *Leaves* 1 2 in, usually rosulate, ovate-cordate or lanceolate

† *Lip smooth channelled or lamellate within but with no hairs or soft setæ*

4 **G. repens,** *Brown in*

Boiss Fl Orient

v 90 G marginata, *Lindl in Wall Cat* 7394, *Gen & Sp Orchid* 493, *in Journ. Linn Soc l c* Satyrium repens, *Linn Sp Pl* 1339

TEMPERATE HIMALAYA, alt 8-11,000 ft, from Simla eastwards to Sikkim — DISTRIB Europe, N Asia N America

Stem 4-8 in *Leaves* dark grey or mottled with paler, ½-1 in *Spike* 1-4 in, often twisted, sometimes almost glabrous, flowers whitish, lateral sepals ¼ in, ovate, acuminate, 1 nerved, dorsal narrow, petals linear, falcate, rostellar arms short, pollinia small, pyriform, sessile on the small gland

5 **G. fusca,** *Hook f Ic Pl ined* [illegible] ovate, spike secund pubescent bracts [illegible] cate with a decurved beak strongly [illegible] anther very small stipitate didymous Aetheria fusca, *Lindl in Journ Linn Soc* i 184 Cystorchis fusca, *Benth in Gen Plant* iii 599

SUBALPINE HIMALAYA, Harung *Munro*, Garwhal, alt 13 000 ft, *Duthie*, Sikkim, in the inner ranges, alt 12-14,000 ft, *J D H*

Roots densely tufted *Stem* 6-12 in often as thick as a swan's quill *Leaves* revolute, 1 1½ in, subacute coriaceous, petiole very short and broad *Spike* very [illegible] ...al narrow 1-nerved lateral ovate- [illegible] sac of lip protruding beyond the [illegible] ...al rostellar arms subulate, anther [illegible] much larger Besides differing in [illegible] of *Cystorchis*, under which genus see observation

6 **G. recurva,** *Lindl in Journ Linn Soc* i 283, leaves linear lanceolate acute, spike secund sharply deflexed glandular pubescent, bracts filiform exceeding the small flowers, lip deeply saccate, beak nearly straight 5 ridged within, column with long slender rostellar arms, anther acuminate

KHASIA HILLS *Lobb*, at Moflong, alt 6000 ft on mossy trunks, *J D H & T T*

Stem 4-6 in, sheathed by the leaves suddenly decurved at the top, so that the spike is pendulous *Leaves* 2-3 by ¼-⅓ in, thick, acute, nerveless not reticulate, narrowed into the broad petiole *Spike* 3 in long, flowers completely secund, sepals ⅛ in long 1 nerved, acuminate, dorsal ovate lanceolate, lateral broader, falcate; petals obliquely linear lanceolate, lip rather longer than the column, tip obtuse *Capsule* pedicelled, ellipsoid ¼ in long

7 **G. Prainii,** *Hook f Ic Pl ined*, leaves ovate acute, spike secund recurved glandular-pubescent, bracts lanceolate equalling the flowers, lip cymbiform obtuse lamellate within, column with long rostellar arms, anther acuminate

8 **G. gracilis,** *Hook f Ic Pl ined*, leaves few petioled elliptic ovate, stem very slender nearly naked, spike short puberulous bracts shorter than the flowers, lip straight oblong concave beaked below the emarginate tip, with two large calli at the base within, and a very thick channelled lamella on the disk, column short, rostellar arms slender

PERAK, *Scortechini*.

Whole plant 8-10 in high, stem slender, with 2-3 distant lanceolate sheaths

drawing of this by Scortechini corresponding to his specimens the leaves are represented as more ovate, acute and strongly crenate

†† *Lip within setose and tubercled*

9 **G. foliosa,** *Benth in Herb Kew*, stem with an elongate decumbent base leafy to the tip, leaves petioled ovate lanceolate, spike glandular-pubescent, bracts much exceeding the flowers, sepals ⅙–⅓ in 3-nerved, lip saccate, beak rather dilated, base within copiously setose, column short, rostellar arms very long slender, anther lanceolate Georchis foliosa, *Lindl Gen & Sp Orchid* 496 G secundiflora *Griff Notul* iii 393 (*excl Plate*) —Goodyera sp *Griff It Notes*, 30, No 591, *Notul* iii 396, No 11, *Ic Pl Asiat* 346, f. 1

SIKKIM HIMALAYA, alt 5–6000 ft, *J D H*, &c ASSAM, the KHASIA and NAGA hills, ascending to 5000 ft, common BURMA, *Griffith* PERAK, alt. 7000 ft, *Wray*

Stem 6–12 in, rather slender *Leaves* 1½–2½ in oblique acute, green, 3–5-nerved, not reticulate, petiole ⅓–⅔ in, sheath short *Spike* 2–3 in, bracts ½–⅔ in, nearly glabrous, flowers pink, sepals ovate lanceolate, obtuse 1 nerved, petals dimidiate-oblong, as broad as the dorsal sepal, 1 nerved pollinia with slender united caudicles —Distinguished from all others of this section by the elongate and leafy stem, except *G vittata*, which has a glabrous spike

10 **G. secundiflora,** *Lindl in Journ Linn Soc* i 182 (*excl cit* ... , mottled with ... rter than the ... in, beak short ... anther ovate ... *Plant Asiat*, t 347, f ...

KHASIA HILLS, alt 4–5000 ft *Griffith*, &c MUNNIPORE, alt 9000 ft, *Watt* —DISTRIB China (*Herb Lindl*)

Stem strict, with spike 6–10 in subtomentosely glandular above *Leaves* 1½–2 in rarely elliptic, acute petiole ¼–½ in *Spike* 2–3 in, flowers all secund, pubescent, white; sepals 1-nerved lateral ⅙–⅓ in long ovate, acute, dorsal much narrower, petals subfalcate crenate on the outer edge, 1 nerved, lip setose on the 5–7 nerves within

11 **G. robusta,** *Hook f Ic Plant ined*, very robust, leaves subradical ovate lanceolate acute, spike glandular tomentose lax fld., bracts shorter than the secund flowers, petals spathulate, lip saccate sparsely setose within beak short lamellate in the disk, rostellar arms slender, anther lanceolate

KHASIA HILLS, alt 4000 ft *J D H & T T*

different

12 **G. vittata,** *Benth in Herb Kew*, quite glabrous, leaves subradical ovate acute dark green with white nerves, bracts about equalling

the flowers, lip saccate long beaked setose within, beak 2-lamellate on the disk *Hook f Ic Plant ined* Georchis vittata, *Lindl. in Journ Linn Soc* i 181

i , fleshy, dark
pals 3-nerved,
petals oblan-
elongate, sub
long gland —

13 **G. hispida,** *Lindl in Journ Linn Soc* i 183, leaves subsessile ovate-lanceolate acuminate, spike and flowers hispidly glandular, bracts shorter than the small flowers, lip saccate shortly obtusely beaked sparsely setose within *Hook f Ic Plant ined*

KHASIA HILLS, at Churra, alt 4000 ft , *J D H & T T*

Described from a solitary specimen, by Lindley, who observes its similarity to *G* ... not appear to have examined the ... It is nearer *G secundiflora*

14 **G. cordata,** *Benth in Herb Kew*, leaves subradical ovate- ... than or equalling ... many nerved setose ... Georchis cordata, ... *f in Gard Chron*

KHASIA HILLS alt 3–4000 ft *J D H & T T* UPPER ASSAM, in the NAGA HILLS, *Prain* ? PERAK *Scortechini*

Rather slender, 6–12 in high *Leaves* 1½–2½ in , variable in depth of basal sinus, acute, petiole ¼–½ in , slender. *Sp*...

15. **G. biflora,** *Hook f. Ic Plant ined* , stem short stout leafy, leaves

TEMPERATE WESTERN HIMALAYA, alt 4–6000 ft Nepal, *Wallich*; Garwhal, *Edgeworth* , Simla, *Gamble*

Stem 2–3 in , leafy *Leaves* 1–2 in , obtuse or subacute, petiole ¼–½ in *Raceme* hardly exceeding the leaves, rachis stout, bracts 1 in , sepals 1 in , dorsal narrowly lanceolate recurved, lateral nearly straight, petals linear, falcate, 3 nerved , lip with a setosely 5 nerved base, beak twice as long as the sac, margins membranous waved; column concave in front, rostellar arms and anther very long and slender. *Capsule* nearly 1 in long

91 HETÆRIA, *Blume* (ETÆRIA)

ÆTHERIA, *Endl*

Characters of *Goodyera*, but lip usually superior, and adnate to the

sides of the column, and stigma with 2 lateral lobes —Species about 13, Indian

1 **H. Gardneri,** *Benth in Gen Plant* iii 604, tall, slender, leaves elliptic acute, spike very long glandular pubescent bracts equalling the very small flowers, petals linear spathulate, lip saccate membranous with a few small calli on the nerves within Rhamphidia Gardneri, *Thwaites, Enum* 313

CEYLON, in the Central Province, *Walker*, &c

Stem 12 20 in, stout and leafy below *Leaves* 2–4 by 1½–2 in, often oblique, 3 nerved, membranous, petiole ½–1 in, sheath large short *Spike* 4–10 in, very many fld, flowers hardly secund, bracts ¼ in, sepals ⅛ in long obtuse, dorsal ovate 1 nerved lateral oblong 3 nerved petals linear spathulate 1 nerved, lip cymbiform, column very short, stigmatic lobes large, lateral, rostellar arms and anther short pollinia subglobose each caudicled —Thwaites describes the lip as with a very few short hairs within

2 **H. ovalifolia,** *Benth in Gen Plant* iii 164, slender, leaves ... bracts exceeding the ... cate tip obtusely 3- ... Goodyera ovalifolia, *Journ Linn Soc* i

MALABAR, at Courtallam, *Wight*

Very near to *H Gardneri* but smaller, 10–14 in long leaves the same, bracts rather longer *Flowers* tinged with pink, dorsal sepal broadly ovate obtuse,

describes the lip as ... nd

3 **H. rubens,** *Benth in Gen Plant* iii 164, tall, leaves elliptic acute spike puberulous bracts equalling or exceeding the flowers petals hammer shaped lip subhemispheric with a small transverse terminal lobe and a jagged callus on each side towards the base within *Hook f Ic Plant ined* Rhamphidia rubens *Lindl in Journ Linn Soc* i 182 Cerochilus rubens, Lindl in *Gard Chron* 1854 87 Goodyera No 4 *Griff Notul* iii 390

SIKKIM HIMALAYA alt 1500–3000 ft, *J D H Clarke* ASSAM, *Mann* UPPER BURMA, *Griffith* (*Kew Distrib*, 5311 and 5312)

Rather stout, 10–18 in high *Leaves* 4–5 by 1½–2 in, as in *ovalifolia* reticulately nerved in the Sikkim ...
1-nerved, broadly ovate ...
lobe sometimes 2 fid, ...
anther ovate cordate, ...
large, rostellar arms very short

4 **H. Helferi,** *Hook f Ic Plant ined*, slender, leaves elliptic spike puberulous twisted bracts shorter than the flowers, petals linear falcate, lip membranous cymbiform acuminate with a few fleshy cilia on each side towards the base within

TENASSERIM Mergui Islands *Helfer*

Stem 6–10 in with the raceme *Leaves* 3–4 in, acute many nerved, mem... long, subequal, ... 2 membranous

5 **H. elongata,** *Lindl in Wall Cat* 7381 (Etæria), *Gen & Sp Orchid* 494 tall slender leaves petioled oblong subacute scape and elongate lax fld raceme and flowers laxly tomentose bracts shorter than the erect ovary sepals oblong obtuse petals broadly obliquely obovate apiculate lip cymbiform acute 5-nerved nerves with 1–2 soft spines towards the base *Hook f Ic Plant ined* Goodyera? elongata *Lindl Gen & Sp Orchid* 494

MALAY PENINSULA, *Herb Finlayson*

Stem with scape and racemes 18 in lower half leafy *Leaves* 2 3 in membranous lower obtuse, petiole ¼ ⅔ in slender, lower sheaths hyaline inflated *Scape* with distant lanceolate sheaths raceme 4 in, bracts ¼ in lanceolate, sepals ⅙ in long lip superior membranous adnate to the sides of the column column short flat, without wings or membranes in front, as long as the sepals, stigmatic lobes lateral rostellar arms subulate, anther ovate cordate, pollinia subglobose, caudicles as long slender gland rather large, oblong

H.

obtuse

PERAK *Scortechini* or Batang Padong alt 4900 ft *Wray*

Habit of *Goodyera procera* but petioles more slender, flowers rather smaller,

DOUBTFUL SPECIES

95 APHYLLORCHIS, *Blume*

Terrestrial leafless herbs caudex tuberous (or of fascicled fibres?), stem simple sheathed *Flowers* small racemed or subspicate *Sepals* subequal, free, erect or spreading *Petals* narrower *Lip* sessile or shortly clawed, ... base 2 auricled or not, stigma short ovate, , pollinia reniform —

* *Flower buds straight*

1 **A. montana,** *Reichb f in Linnæa* xli 57, sepals and petals linear-oblong obtuse, lip narrowly obovate oblong contracted beyond the

middle, and side lobes rounded at the base, claw short broad with 2 linear-calli tip obtuse thickened Apaturia montana, *Thwaites Enum* 301 (*not of Lindl*)

? KHASIA MTS, alt 3500 ft, and SIKKIM HIMALAYA, *Griffith* CEYLON, Ambigamowa district, rare, *Thwaites*

Stem 2 ft, with 8–10 loose stout basal sheaths, and a few distant higher up, yellowish tinged with purple *Raceme* 4–8 in, lax fld, bracts ¼–⅜ in, lanceolate, acuminate, pedicel with ovary ⅔–1 in, sepals ⅓–⅔ in, and petals straw coloured, backs and tips purple, lip broader than the sepals, base contracted into the sub saccate short claw, nerves with diverging nervules, column very slender —I find no sufficient character whereby to separate the Sikkim and Khasia specimens, but these latter are quite insufficient for identification

2 **A. Prainii,** *Hook f Ic Plant ined*, sepals and petals linear oblong obtuse, lip ovate, claw saccate with two falcately ovate acute wing-like auricles

NAGA HILLS, *Prain*

Very like *A montana* in size, habit, and inflorescence, distinguished by the winged claw of the lip I have seen but one specimen

3 **A. ? vaginata,** *Hook f Ic Plant ined*, stem stout clothed with lax obtuse sheaths, lip sessile lanceolate acuminate

KHASIA HILLS, at Mamloo, in woods alt 5000 ft, *J D H & T T*

Stem 6 in, stout, sheaths ½ in, loose, membranous obtuse *Raceme* few fld, bracts large sheathing, flowers subsessile, erect about ½ in across, dingy red, sepals broadly ovate, obtuse, 3 nerved, petals lanceolate acuminate 1-nerved, lip broader than the sepals as long, with no vestige of claw or caruncle column shorter than in the other species of the genus acuminate —I have seen but one specimen of this curious plant which differs from its congeners in the sessile lip and shorter column The flowers are young, and too much confidence must not be placed in the diagnosis

** *Flower buds decurved*

4 **A. pallida,** *Blume Bydr* t 77, *Orchid Archip Ind* 52 t 13 f 1 & 17 D, sepals and petals falcate, claw of lip with large oblique auricles limb 3 lobed, base cordate, side lobes oblong, midlobe oblong obtuse carunculed

PERAK, *Scortechini*, in rocky places alt 800–1000 ft *King's Collector*, alt 3900 ft, *Wray* —DISTRIB Java

Root of long tomentose fibres *Stem* 12 18 in rather flexuous slender, spotted with brown pink, sheaths few, obtuse *Racemes* 2–6 in lax fld, bracts oblong upper ovate, pedicel erecto patent with the ovary ½–⅓ in flowers ½ in long decurved pale brownish-pink, spotted with dark brown, sepals linear oblong obtuse concave, petals strongly falcate, 1 nerved lip recurved, column subclavate anther didymous, pollinia (*Ic Scortechini*) pyriform (in *Ic Blume* reniform)

96 CRYPTOSTYLIS, *Br*

Terrestrial herbs, caudex short, stout *Leaves* basal long petioled membranous *Scape* leafless *Flowers* loosely racemed or subspicate *Sepals* subequal, and petals very narrow, widely spreading *Lip* superior, erect, lanceolate from a broad base which embraces the column contracted above it, entire *Column* very short stigma at ut, rostellum broad, thick, erect, acuminate, anther obtuse or acuminate pollinia

pyriform, free, or fixed to the rostellum —Species 7, Indian, Malayan, and Australian

C. Arachnites, *Blume Orchid Archip Ind* 132, t 45 Zosterostylis Arachnites, *Blume Bijdr* 419, t 32 Z zeylanica *Lindl Gen & Sp Orchid* 446, *Thwaites Enum* 312 Z Walkeræ, *Wight Ic* t 1748 f 4

KHASIA HILLS *Griffith* at Churra alt 4500 ft, *Clarke* PERAK *Scortechini*, &c PENANG, *Hullett* CEYLON, *Walker*, ascending to 4000 ft, *Thwaites* —DISTRIB Java

Root of long fleshy tomentose fibres *Leaves* 1–3 all radical, 3–6 in, elliptic or elliptic lanceolate, acute, many nerved and trabeculate, primary nerves 3 indistinct, petiole rather longer, embraced at the base by membranous sheaths *Scape*

97 CORYSANTHES, Br

Very small, terrestrial, 1 leaved, 1-fld herbs *Leaf* suborbicular *Flowers* large red-purple *Dorsal sepal* falcate, laterals and petals filiform, or petals 0 *Lip* large, erect, base tubular, dilating into a broad reflexed toothed or fimbriate limb *Column* short, erect, 2 winged at the tip, stigma broad, anther erect, pollinia oblong free or sessile on the rostellum *Capsule* erect on an elongate pedicel —Species about 15, Australian and Malayan

1 **C. picta,** *Lindl Gen & Sp Orchid*, 394, lateral sepals and petals much longer than the dorsal sepal, limb of lip broadly obovate erose puberulous within *Blume Orchid Archip Ind* 174, t 64 f 1 Calcearia picta, *Blume Bijdr* 417, t 33 *right hand figure*

PERAK, near the top of Tambak Bitak, *Scortechini* —DISTRIB Java

Stem 1–2 in, base
margins waved *Flower*
a long claw, margined
lip strongly recurved
limb reflexed deep violet

PERAK, Gunong Enar and Tambok Balak, *Scortechini* —DISTRIB Java

Stem ½–2 in *Leaf* ½–¾ in, ovate cordate, margin not waved *Flower* sessile,

98 POGONIA, Griff, Sect NERVILIA

Terrestrial tuberous 1-leaved herbs, leafing after flowering *Leaf* very

broadly cordate or orbicular, strongly plicate *Flowers* solitary, few, or many, racemed, horizontal or pendulous
connivent or widely spreading *Lip* 1
column sessile or sub clawed, usually
spur a very short sac *Column* elong
broader, rostellum short, anther subs
erect or pendulous —Species about 30,

The above characters apply exclusively to the section *Nervilia*, (genus of Gaudichaud), to which all the Old World species of *Pogonia* belong, and which all flower before leafing All the other species except one Japanese are New World, and their flowering stems bear leaves —The species are very difficult of analysis from Herbarium specimens, but I have been greatly aided by the drawings in Herb Kew, and those of Herb Calcutt, kindly lent by Dr King All want revision

* *Stem* 1–3 *fld*

1 **P. plicata,** *Lindl Gen & Sp Orchid* 415, leaf orbicular cordate hairy, stem 1–3 fld, lip embracing the column, tip dilated 2 lobed. Epipactis plicata, *Roxb Fl Ind* iii 451 Arethusa plicata, *Andr Bot. Rep*, t 321

2 **P. biflora,** *Wight Ic* 7399 leaf unknown stem 2 fld, lip obovate obtusely 3 lobed about the middle, embracing the column

MALABAR, in the Wynaad jungles *Jerdon*

Tuber globose *Flowering stem* 2–4 in, bracts slender, flowers 1½ in diam,

453

ASSAM (*Ic in Herb Calcutt*) SILHET, *Clarke* LOWER BENGAL, *Roxburgh* *Clarke* CEYLON, in the Doombera district, *Thwaites*

Tuber globose *Leaf* 2 3 in 5 7-nerved green or purple beneath; petiole

4 **P. velutina,** *Par & Reichb f in Trans Linn Soc* xxx 142 leaf orbicular cordate velvety on both surfaces, stem 2 fld lip shorter than the sepals embracing the column oblong ovate obtuse

TENASSERIM, at Moulmein, *Parish*

5 **P. macroglossa,** *Hook f Ic Plant ined* , leaf unknown, stem 1 fld , lip longer than the sepals embracing the column strap shaped obtuse

SIKKIM HIMALAYA , in hot valleys, *J D H* at Tumlong, alt 6500 ft , *Clarke*

Flowering stem 3–6 in , bracts small, slender sepals 1–1¼ in , linear lanceolate, acuminate, white flushed with pink , lip 1½ by ½ in , of the same breadth from the rounded base to the rounded apex except across the very small side lobes that project beyond the middle nerves very slender , there is an appearance of lines of roughness on each side of the midrib opposite the side lobes *Column* very slender, tip clavate —Near *velutina*, but very distinct in the rather broader sepals, and shape of the remarkable lip which exceeds the sepals

6 **P. maculata,** *Par & Reichb f in Trans Linn Soc* xxx 143, leaf orbicular cordate glabrous stem 2 fld lip shortly spurred at the base embracing the column ovate lanceolate 3 lobed about the middle woolly within *Hook f Ic Plant ined*

TENASSERIM at Moulmein, *Parish*

Leaf about 2 in diam about 13 nerved green with a black purple spot at the base of each fold beyond the middle , petiole 2–3 in *Flowering stem* 5–6 in , slender, bracts minute sepals and petals ¾ in narrowly oblanceolate green, lip equalling the sepals, yellow green with dark green veins column rather slender ; anther purple

** *Flowers racemose Bracts elongate linear-lanceolate, reflexed*

7 **P. Gammiena,** *Hook f Bot Mag* t 6671 , leaf orbicular- or ovate-cordate acuminate glabrous, margin waved, sepals and connivent petals spathulately oblanceolate acute, lip saccate at the base, hypochile narrow much longer than the orbicular waved hairy epichile

st
1
sepals

8 **P. Scottii,** *Reichb f in Flora*, 1872, 276, leaf large reniform

at Seetakoond

petiole 12 in ,
¼ in , reflexed,

drawing

9 **P. carinata,** *Lindl Gen & Sp Orchid* 414, *in Journ Linn Soc* iii. 45 (*excl syn Griff*), leaf orbicular or cordate 7–9 nerved glabrous, sepals and petals narrowly oblanceolate acuminate lip 3 lobed about the middle pubescent, side lobes very short midlobe broadly ovate acute crenate, nerves rectangular ? *Dalz & Gibs Bomb Fl* 270 Epipactis carinata *Roxb Fl Ind* iii 452

PLAINS OF INDIA, from Rohilcund to Lower Bengal and the DECCAN PENINSULA PEGU, *Kurz*

Leaf 1½–2½ in diam, cuspidate, not waved petiole 1 2 in *Flowering stem* with raceme 6–12 in, green, bracts ¼ in, sepals and petals 1 in, green lip not saccate at the base, white with red or purple veins —I am unable to discriminate satisfactorily in Herbarium specimens of the flower (carefully moistened and laid out) between this and *flabelliformis*

10 **P. flabelliformis,** *Lindl in Wall Cat* 7400, *Gen & Sp Orchid* 415 *in Journ Linn Soc* iii 45 leaf large orbicular cordate many-nerved lip 3 lobed about the middle side lobes obtuse, midlobe ovate acute crisped and hairy ? *Dalz & Gibs Bomb Fl* 270 P Nervilia, *Blume Mus Bot* i 32 P carinata *Wight Ic* t 1720 Nervilia Aragoana *Gaud in Freyc Voy Bot* 422 t 35

TROPICAL HIMALAYA, from Garwhal alt 4–5000 ft *Falconer*, &c eastwards ? TENASSERIM *Parish* —DISTRIB Marianne Islands Timor

Leaf 4–10 in diam cuspidate margin waved petiole 4 8 in *Flowering stem* stout, 6–12 in, raceme lax fld flowers pale green, sepals ⅝ in long l near lan
e sepals like that
the many nerved
ns In a drawing
at the apex with
three green medial nerves meeting in the apex and many red side nerves In his specimen the tip of the lip varies to rounded the side lobes are rounded, not acute as in *carinata* and its nerves are not rectangular but ascending

DOUBTFUL SPECIES

POGONIA No 1 *Griff Notul* iii 376 stem 4 in 1 fld, flower 1 in long,

of violets

99 DIDYMOPLEXIS, *Griff*

(LEUCORCHIS *Blume*)

Slender (parasitic?) leafless tuberous herbs *Scape* simple flexuous flowers few, small, racemed pedicels greatly elongate in fruit *Sepals* dorsal and petals connate forming a 3 fid upper lip lateral connate into an entire or 2 fid lower lip forming a small mentum with the foot of the

thickened towards the tip, I find nothing to distinguish this from the Japan plant; the column and anther are identical, I failed to find pollen The flowers, black when dry, are so fragile that I had great difficulty in making out their structure

101 EPIPOGUM, *Gmelin*

Terrestrial leafless brownish herbs, root tuberous or coralloid, stem erect, sheathed *Flowers* laxly racemed *Sepals* and *petals* subequal, free narrow, erect or spreading *Lip* sessile at the base of the column, superior or inferior ovate entire or 3 lobed, spurred, base broad, disk with rows of

thickened,
strap to a

1 **E. aphyllum,** *Swartz Summ Veg Scand* 1814 root branching, column cylindric, spur very large as long as the superior 3 lobed lip

Fl Orient v 93,
Monocot iii No 23
Gen & Sp Orchid
atyrium Epipogium,

Linn Syst Veg 676, *Jacq Fl Austr* t 84

WESTERN TEMPERATE HIMALAYA alt 6–8500 ft, Kashmir, *Clarke*, Simla *Thomson*, Garwhal *Duthie* —DISTRIB Europe, N Asia

Stem 4–8 in, often very stout and swollen at the base sheaths 1–2, short,

2 **E. nutans,** *Reichb f in Bonpland* 1857, 36, root an oblong tuber, spur straight shorter than the inferior entire lip *Lindl in Journ Linn Soc* i 177, *Benth Fl Austral*

nutans, *Blume Bijdr* 415, t 3, *Mus*
139, t 52 & 54 E, G rosea *Blume* L
139, Podanthera pallida *Wight Ic* t
& Sp Orchid 383 Limodorum roseum, *Don Prod* 30

TROPICAL HIMALAYA, Nepal, *Wallich*, Sikkim, in hot valleys, *J D H*

ridges

102 CEPHALANTHERA, *Richard*

Terrestrial herbs, leafless and tuberous rooted, or with leafy stem and fibrous roots *Leaves* sessile, plicate *Flowers* suberect, spiked or racemed *Sepals* and *petals* subsimilar, free, conniving *Lip* included

erc

th

let

C. ensifolia, *Richard Orchid Annot* 29, leaves ovate or lanceolate, bracts of the upper flowers much smaller than the almost glabrous ovaries, epichile triangular obtuse 5 ridged *Lindl Gen & Sp Orchid* 412, *in Journ Linn Soc* i 172, 175, *Boiss Fl Orient* v 85 C Xyphophyllum, *Reichb Ic Fl Germ* xiii t 470 C acuminata *Lindl in Wall Cat* 7405, *Gen & Sp Orchid l c*, *Wight Ic* t 1721, *Dcne in Jacquem Voy Bot* 164, t 161

TEMPERATE HIMALAYA, alt 6–12 000 ft, from Kashmir to Bhotan —DISTRIB

SPECIES UNKNOWN TO ME

C THOMSONI, *Reichb f in Linnæa* xl 54 a span high leaves (of *C grandiflora*) oblong acute, upper linear lanceolate bracts linear lanceolate lower much longer

from Reichenbach I have examined no *Cep t ant lera* answering to the description, nor, as I am informed by King is there any in the Calcutta Herbarium whence Reichenbach s specimens must have been sent to him)

103 EPIPACTIS, *Br*

Terrestrial leafy erect herbs *Leaves* sessile plaited *Flowers* racemose, pendulous bracts long leafy *Sepals* and *petals* broad acuminate, strongly-nerved *Lip* sessile on the base of the column hypochile concave or saccate epichile contracted at the base entire *Column* short stigma anticous, rostellum broad prominent anther erect obtuse, cells contiguous, pollinia 2 2 partite gland globose —Species 8 or 10 of the temperate N hemisphere

Lindley (*in Journ Linn Soc* i 172) is disposed to refer all the Himalayan species to states of *E latifolia* in which I do not concur

E. latifolia ... *Holm* 1800 232 flowers subsecund ... hypochile subglobose epichile as long or ... calli *Lindl Gen & Sp Orchid* 461, ... *Fl Germ* xiii t 134–136 E macro... 461 E consimilis *Don Prodr* 28 E

TEMPERATE HIMALAYA from Kashmir alt 6500–10 000 ft to Sikkim alt 10–11 000 ft —DISTRIB Europe N Africa N Asia to Japan

Stem 1 3 ft, stout puberulous above *Leaves* 3 5 by 2 3 in usually from orbicular to ovate lanceolate rarely lanceolate often with crisp undulate margins, flowers ½–¾ in diam in often crowded bractate racemes green variegated with yellow white or purple *Column* very short

Var *herbacea*, smaller, leaves elliptic acute, raceme dense fld, flowers ½ in diam glabrous pale greenish white E herbacea, *Lindl in Royle Ill* 368; *Gen & Sp Orchid* 462 —Western Himalaya

ALPINE HIMALAYA, alt 11–13 000 ft, Kumaon and Garwhal, *Royle, Duthie*, SIKKIM, *J D H*

Stem very short, sheathed, root elongate, stout, branching into thick fibres *Leaf* 1–3 in, sessile or petioled, obtuse fleshy, base narrowed *Scape* 2–5 in very stout, flexuous, flowers 2–4, dark purple, ½ in diam, bracts ¾–1 in, ovate, obtuse, dorsal sepal ovate, obtuse, lateral oblong, subacute, petals ascending, elliptic, obtuse, lip variable in breadth, from elliptic to cuneate obovate, crenulate, spur variable in length, stout, obtuse, anther cells parallel

4 **O. Stracheyi,** *Hook f Ic Pl ined*, leaf solitary radical elliptic or obovate spike few-fld, bracts longer than the flowers leafy, sepals subequal lateral suberect, lip longer than the sepals broadly cuneate 3 lobed to the middle, lobes obtuse, spur as long as the ovary stout incurved obtuse

WESTERN HIMALAYA, Garwhal, near Rogile, alt 11,000 ft, *Strachey* and *Winterbottom* (No 35 Gymnad puberula)

This has the solitary leaf of *O spathulata*, and the flowers of *O Chusua*, can it be a hybrid?

105 HERMINIUM, *Linn*

sol

globose or clavate processes, rostellum of

dicl

or large, or with each gland and its c
coriaceous extinguisher-like shiny br
European and N Asiatic

* *Lip 3 lobed*

ET, alt 10–13 000 ft, from Kashmir to

Leaves 1–4 in *Scape* naked, rarely 2-
ers subsecund, ¼ in diam, yellow-green;

musky at night, sepals and petals subconnivent; sepals oblong, obtuse, petals unequal-sided towards the base, tips fleshy, lobes and lip narrow, base concave, rostellum prominent between the base of the anther-cells

H. [illegible] elongate linear, spike [illegible] ry or shorter, flowers [illegible] linear equalling the [illegible] he middle, side lobes [illegible] *Lindl in Wall Cat* [illegible] 1525, *in Journ Linn* [illegible] longicruris, *Wright in* [illegible] *n Lindl Veg Kingd* 183, c (name only)

TEMPERATE HIMALAYA, from 4–8000 ft in the North West, and 6–15 000 ft (*Clarke*) in Sikkim KHASIA HILLS, alt 5–6000 ft UPPER ASSAM, in the Naga Hills, alt 7000 ft, *Clarke*, *Prain* TENASSERIM *Parish*.—DISTRIB China, Manchuria, Japan

3 **H. fallax,** *Hook f Ic Plant ined*, slender, leaves 1–2 towards the middle of stem linear or linear lanceolate, spikes many-fld subsecund, bracts longer than the short decurved ovaries, sepals spreading oblong or ovate lanceolate broader than the erect narrow falcate petals lip shorter than the sepals obtusely 3 lobed, sac incurved subdidymous subglobose or clavellate with an inflated tip Peristylus fallax, *Lindl Gen & Sp Orchid* 298 Herminium fallax *Lindl in Wall Cat* 7412 Cybele, *Falc in Lindl Veg Kingd* 193, c C alpina *Falc mss*

ALPINE and SUB-ALPINE HIMALAYA, alt 7–12,000 ft, from Garwhal to Sikkim

Very variable in height, from 4–18 in, stem with long tubular sheaths at the base, and one or two lanceolate sheaths above the leaf *Leaves* usually solitary about the middle of the stem 2–5 by $\frac{1}{2}$–1 in, acute sometimes two suboppo ite towards the base of the stem *Scape* naked, spike 2–5 in lax or dense fld, lower bracts $\frac{3}{4}$ in or less, lanceolate, ovary $\frac{1}{6}$–$\frac{1}{4}$ in, shortly beaked, sepals $\frac{1}{6}$ in, 1 nerved, and

** *Lip entire* *Bracts short in all but* H gramineum

H. [illegible]

SIKKIM HIMALAYA, alt 11–14 000 ft *J D H*

Plant, 5–12 in high *Leaves* 3–5 by $\frac{1}{4}$–1 in, obtuse acute or acuminate *Spike* 1–4 in, flowers $\frac{1}{4}$ in diam, not secund, bracts much shorter than the gibbous ovary, sepals 3 nerved, lateral falcately ovate, base rounded, petals as long ovate, tips narrowed thickened obtuse, lip larger than the sepals, flat, with a thickened

5 **H. Duthiei,** *Hook. f Ic Plant ined*, leaves 2 towards the middle or base of the stem linear or oblanceolate, spike many fld sub- ovaries, sepals obtuse dorsal petals ovate lanceolate fleshy, ntire subacute or obtuse, sac globose

WESTERN HIMALAYA; Garwhal, near the Khasi Pass, alt 11–12,000 ft, *Duthie*
Whole plant, with the spike 4–6 in *Leaves* shorter than the scape acuminate *Scape* stout, curved, naked, spike 2–4 in, ovaries ¼ in, turgid, curved almost

6 **H. congestum,** *Lindl in Wall Cat* 7068, *Gen & Sp Orchid* 305, *in Journ Linn Soc* iii 43, leaves 1–3 oblanceolate, scape elongate, spike many fld, bracts minute, flowers minute decurved, sepals obtuse, petals rather longer acute, lip ovate saccate H unalaschcense, *Reichb* .benaria Schischmareffiana *Chamiss* hischmareffiana, *Lindl Gen et Sp Orchid* 286 Neottia macrophylla, *Don Prodr* 27 Spiranthes macrophylla & unalaschcensis, *Spreng Syst* iii. 708

ALPINE HIMALAYA, NEPAL, *Wallich*, Sikkim alt 11 16 000 ft, *J D H* DISTRIB Aleut an Islds
Stem 6–18 in, leafy towards the base or upwards *Leaves* 3–6 by ⅓–⅔ in *Scape*

7 **H. pugioniforme,** *Lindl mss*, leaf solitary elongate spathulate obtus, spike few fld, bracts minute orbicular, flowers minute suberect, petals oblong ovate, lip dagger-shaped, base dilated

Garwhal, alt 14–15 000

in broad *Scape* rather dorsal sepal orbicular lateral very broad obtuse, petals smaller, lip hardly longer than the sepals —Very near *congestum*, but I think different, the flowers appear to be nearly erect

8 **H. orbiculare,** *Hook f Ic Plant ined*, stem very slender 1–2-leaved and with minute subulate sheaths, bracts minute, flowers very minute secund sepals orbicular oblong obtuse dorsal smaller, petals broadly oblong, lip orbicular fleshy with a pit towards the centre and gibbous beneath

SIKKIM HIMALAYA; Rungboo in the Chumbi Valley, *King's Collector*

Stem with spike 4–6 in *Leaves* 2, towards the base of the stem, 1–1½ in long, oblanceolate, bracts much shorter than the ovaries which are ⅛ in long curved, flowers $\frac{1}{16}$ in diam sepals and petals 1 nerved, all membranous, anther-cells rather divergent, pollinia clavate, gland orbicular translucent, stigmatic processes obscure; rostellum minute —A very distinct little species, but the flowers are so minute that I cannot satisfactorily analyze the column

9 **H.** [illegible] & Sp Orchid
305, [illegible] ecund suberect,
bracts [illegible] subfalcate, lip
ovate [illegible] *Royle Ill* t 87
Neott [illegible] phylla, *Spreng*
Syst [illegible]

WESTERN and CENTRAL HIMALAYA, Nepal, *Wallich* Kumaon and Garwhal, alt 5–8000 ft

[illegible]

recurved, retuse, fleshy

106 HABENARIA, *Willd*

Terrestrial leafy herbs with undivided or lobed tubers, and fleshy radical fibres *Leaves* not plaited, bases sheathing *Flowers* spicate or racemed *Sepals* subequal or the dorsal shortest lateral ascending spreading reflexed or deflexed *Petals* smaller or larger, simple or cleft (sect *Ate*) *Lip* continuous with the base of the column entire 3 lobed or 3 partite, base spurred *Anther* adnate to the very short column, cells parallel or divergent below, bases often produced into a long or short tube pollinia clavate or pyriform, caudicle long short, or 0, sometimes winged, glands exposed, rarely overlapped by the rostellum staminodes granular surfaces on the side of the anther rarely elongate, stigma a single or double viscid area on the column below the anther, or two globose or clavate processes, rostellum usually small and erect between the cells of the anther, rarely wholly obsolete —Species about 400, temperate and tropical

After devoting many months to the examination of the Indian species of

[illegible]

much nomenclature a d the multiplication of synonyms and so should also be

[illegible]

will help much towards the classification of the species f r I think its value in this respect has been greatly overrated in b th *Ophrydeæ* and *Vandeæ*

difficult to say whether the lateral sepals are reflexed naturally or accidentally, or

Key to the Sections

A *Lateral sepals spreading deflexed or reflexed*

In some small-flowered species of Sect v *Peristylus*, the lateral sepals appear to be spreading or deflexed during or after flowering and might hence be placed in Sect III

Sect I Ate *Petals* truncate 2 fid or 2 partite *Lip* 3 lobed or partite (Sp 1–14)

Sect II Platyglossa *Petals* entire *Lip* 3 lobed or -partite, side lobes broad (narrow in *H platyphylla*) petaloid, mid lobe narrow (Sp 15–34)

Sect III Trimeroglossa *Petals* entire *Lip* 3 partite, side lobes very narrow, entire usually filiform (lip entire in *Peloria* forms of *H Mandersii* and *reniformis*) (Sp 35–66)

Sect IV Hologlossa. *Petals* entire *Lip* entire, linear (Sp 37–66)

B *Lateral sepals erect, or ascending parallel to the dorsal and petals, or forming a hood with these, rarely at length spreading or deflexed*

Sect V Peristylus *Petals* entire *Lip* usually 3 fid or 3 partite (entire in *H breviloba*) —*Flowers* usually very small, and *petals* broader than the lateral sepals and often fleshy, spur rarely exceeding the ovary, usually very short or saccate (Sp 67–99)

Lip broad, entire, petaloid, the axils of sheathing leaves, See also 32 *H triflora*) (Sp 100–102)

Aberrant Species (or Genera?) of Group B

VII Plectoglossa *Flowers* large, in the axils of imbricating leaves *Lip* coriaceous, clawed, 3-fid, longitudinally 3 plicate in bud, spur long slender *Stigmatic processes* large, rhomboid, rostellum broad, triangular (Sp 103)

VIII DIPHYLAX *Flowers* small, secund, lip entire, spur short, fusiform *Anther* with a setiform staminode on each side as long as itself. (Sp 104)

IX DIPYLA *Flowers* small, secund *Lip* 3 fid, spur inflated *Pollinia* sessile on a single large obcordate gland seated in a sinus of the broad 2 lobed rostellum *Stigmatic processes* small (Sp 105)

X. DITHRIX *Flowers* small, secund, tubular, sepals petals and lip coherent at the base *Lip* oblong, 3-fid, base saccate *Staminodes* 2, filiform, capitate, inserted on the back of the anther *Stigma* a transverse cushion, rostellum a transverse plate below the anther (Sp 106)

Sect 1 ATE See p 132.

* Petals truncate or 2 fid

1 **H. lucida,** *Wall in Lindl Gen & Sp Orchid* 314, leaves fascicled towards the base of the tall scape, sepals cymbiform, petals subpanduriform truncate Platanthera lucida, *Lindl in Wall Cat* 7047

PEGU, at Rangoon, *Wallich* TENASSERIM, at Moulmein, *Parish* —DISTRIB Siam

Leaves 4–8 by 2 2½ in, petioled, obovate or oblanceolate *Scape* with the very lax-fld raceme 12–20 in, bracts broadly ovate, half as long as the slender pedicelled beaked ovary, or longer, tips subulate, flowers ½ in diam, greenish, lateral sepals reflexed, obtuse, petals smaller and narrower, contracted below the truncate end, lip subequally 3 partite, midlobe narrow 3 nerved thick, rather longer than the sepals, lateral as long spreading and incurved, spur slender, curved, nearly as long as the ovary or longer, mouth with a short ligule, anther-cells short, erect, approximate, tubes short upcurved, pollinia pyriform, gland long narrow, stigmatic processes short, clavate, rostellum minute

2 **H. barbata,** *Wight in Wall Cat* 7034, stem leafy, petals 2 fid pubescent Ate virens, *Lindl Gen & Sp Orchid* 327, *Wight Ic* t 928, *Thwaites Enum* 309

TRAVANCORE, in the Pulney and Dindyghal Mts, *Wight* CEYLON, in the Maturatt district

Stem 10–12 in *Leaves* 3–5 in, erect, lanceolate, acuminate *Racemes* few fld, bracts large, sheathing, as long as the flowers, or longer, flowers ¾ in diam, green, lateral sepals narrowly falcate, acuminate, petals much broader, base rounded, upper lobe much the longest, tips filiform lower broad acuminate, sinus rounded; lip longer than the sepals, scabrid, limb linear, trifurcate at the end, the segments subulate, spur as long as the ovary mouth with a very long recurved ligule, anther-cells parallel, tubes as long as the cells upcurved, pollinia clavate, caudicles very long, glands small stigmatic processes very long spreading, rostellum minute *Capsule* ¾ in long linear-oblong

3 **H. acuminata,** *Thwaites in Trim Cat Ceyl Pl* 91, stem leafy, petals 2 fid glabrous Ate acuminata, *Thwaites Enum* 309

bra

¾ in

slender exceeding the dorsal sepal and about twice as long as the subulate lower,

** Petals 2 partite

† Stem leafy upwards Racemes many fld

§ *Sepals with filiform tips*

4 **H. stenopetala,** *Lindl Gen & Sp Orchid* 319 (*not* 324), tall, mplexicaul, tals slender spur long

small

5 **H. macrostachya,** *Lindl Gen & Sp Orchid* 307, leaves large

TRAVANCORE on the Anamallay hills *Peddome* (in *Herb Calcutt*) CEYLON, *Macrae*, alt 4000 ft *Thwaites*

Stem 2 ft *Leaves* 5-7 in, obovate or oblanceolate, acute, broadly petioled

tellum small — The spur is stoutest in the Travancore specimen

6 **H. andamanica,** *Hook f Ic Plant ined*, leaves crowded towards the middle of the stout stem, raceme lax fld, bracts rather shorter than the ovary, upper segment of petals very slender lower broader divided above the middle into 3 filiform laciniæ, side lobes of lip palmately multifid, midlobe linear 3 fid, spur shorter than the ovary

ANDAMAN ISLANDS, *Parish*

Stem 12-18 in *Leaves* 3-4 in ovate lanceolate, acute *Raceme* 6 8 in, bracts lanceolate; ovary 1½ in very slender; sepals ¼ in long, laciniæ of mid-lobe of lip filiform, anther-cells parallel, tubes rather shorter than the cells, glands of pollinia minute, stigmatic processes subcylindric, elongate, rostellum erect

§§ *Sepals without filiform tips*

7 **H. digitata,** *Lindl Gen & Sp Orchid* 307, leaves ovate or ovate oblong raceme laxly many fld, lateral sepals ovate acute, dorsal suborbicular, petals bipartite, segments subequal or the upper broader, lip tripartite segments linear, spur equalling the ovary *Dalz & Gibs Bomb*

Fl 267. • H. trinervia, *Wight Ic* t. 1701. Bonatea punduana, *Lindl in Wall. Cat.* 7063 B benghalensis, *Griff. in Calc Journ Nat Hist* iv 382. B herbacea, *Wall mss.*

KASHMIR, *Falconer* ASSAM, *Simmons* SILHET, *Wallich* BENGAL, *Griffith* TENASSERIM, *Parish* The WESTERN GHATS, from the Concan southwards

Stem 1–2 ft, leafy *Leaves* 2–5 in, very variable, acute or acuminate, rarely narrowed into a petiole, from orbicular to lanceolate *Raceme* 3–5 in, bracts large, lanceolate, often almost foliaceous and exceeding the flowers, pedicels very short;

ribs thick

Var *foliosa*, sm
dense-fld, bracts shor
Nat Ser 2 xv. 71,
Dalz. in Hook Jou
7038 B Orchis mysorensis, *Herb Heyne* —Nilghiri Mts, alt 6–8000 ft Bombay, at Salsette, *Dalzell* —I have not seen the Salsette plant (*H laciniata*) of Dalzell, which he describes as having the posticous segment of the petals spirally twisted, and the mid segment of the lip broader than the others, he refers it to *H foliosa* quoting Wight's plate, and adds that it is allied to *H lancifolia*, A Rich

(*not of Steudel*)

TRAVANCORE, on the Pulney Hills, *Wight*

Stem slender, 12–18 in *Leaves* 1–2 in *Raceme* 3–5 in, bracts as long as the beaked ovary or longer, flowers ⅓–½ in diam, dorsal sepal orbicular lip longer than the sepals —The pubescent sepals (not observed by Wight) and habit distinguish this from all forms of *H digitata*, of which however it may prove to be a variety The leaves and flowers are much smaller, and the ligule at the mouth of the spur very short

9 **H. Gibsoni,** *Hook f Ic Plant ined*, very stout, leafy, leaves linear oblong, raceme few-fld, bracts equalling or exceeding the ovary, flowers 1 in diam, petals bipartite, segments narrow subequal, lip tripartite segments linear-subulate subequal fleshy, mouth of clavate spur broad without a ligule

The CONCAN, near Kyreswur and at Kandalla, *Gibson*

Stem 8–12 in *Leaves* 4–6 in base sheathing *Raceme* short, 6–8 fld, bracts 1–1½ in, membranous, broadly lanceolate the lower exceeding the flowers flowers white? as in *H digitata*, but twice as large, upper segment of petals broadest, fleshy, and anther broad, stigmatic processes adnate to the back of the broad mouth of the spur, rostellum small, triangular, exposed —Much like a gigantic state of *H digitata*, but very robust with much longer leaves, narrower for their length, and few very large flowers, and no ligule at the very broad mouth of the spur

10 **H. dolichostachya,** *Thwaites Enum* 309, stem leafy upwards leaves oblong lanceolate amplexicaul, raceme lax fld, bracts as long as the flowers, lateral sepals ovate lanceolate acute, petals bipartite, lower segment short subulate, lip tripartite, segments filiform the middle longest, spur as long as the ovary slender

CEYLON, in the Central Province alt 5000 ft, *Gardner, Thwaites*

Stem 2–3 ft leafless below slender *Leaves* 2–3 in *Raceme* 1 ft, flowers subsess le about ½ in broad dorsal sepal orbicular mucronate, lip longer than the sepals, side segments spreading spur as long as the hardly beaked ovary mouth with a short ligule anther broad cells parallel tubes long upcurved glands of pollinia small, stigmatic processes clavate incurved round the mouth of the spur, rostellum short, triangular—Nearly allied to *H digitata* but the flowers are smaller and the base of the leaves amplexicaul

11 **H. corymbosa,** *Parish & Reichb f in Trans Linn Soc* xxx

TENASSERIM at Moulmein *Parish*

Stem 2 3 ft leafy upwards but naked below and with only sheaths for the upper half *Leaves* 3–6 in base contracted *Raceme* 3–4 in very dense fld, m sepals 3 nerved, clavate, anther cells glands minute, stig

12 **H. dichopetala,** *Thwaites Enum* 309, leaves crowded about the middle of the stem ovate or ovate lanceolate lateral sepals ovate acute, dorsal orbicular, petals bipartite, segments divaricate elongate lowest narrowest and longest lip tripartite segments equal elongate setaceous spur as long as the ovary slender pendulous

†† Stem leafy at or near the base only

13 **H. grandiflora,** *Lindl in Wall Cat* 7032, leaf solitary

14 **H. rariflora,** *A Rich in Ann Sc Nat Ser* 2 xv 70, t 2, leaves radical or subradical linear oblong or lanceolate acute, flowers few long pedicelled upper segment of petals ovate acuminate lower usually much longer filiform, lip tripartite, lateral segments filiform, median

linear, spur very long and stout *Wight Ic* t 924, *Dal & Gibs Bomb Fl* 269 H uniflora, *Dalz in Hook Journ Bot* iii (1857) 314

The DECCAN PENINSULA on the Ghats ascending to 6000 ft from Canara to Travancore

Leaves very variable, in small specimens 2–3 by ½ ½ in and linear, in others 3–4 by ½–¾ in or ovate complicate and bracts shorter than the stiff erect 1 2 in , flowers very variable in n broad lateral 5 nerved upper nerved , anther large, apiculate cells lima orbicular stigmatic processes clavate rostellum erect slender — In Dalzell s *H uniflora* the segments of the petals are described as subequal

Sect II PLATYGLOSSA (See p 132)

* Side lobes of the lip lacerate to the middle or inner margin midlobe linear

15 **H. Susannæ,** *Br Prodr* 312 tall robust, leaves ovate oblong upper sheathing flowers few very large lateral sepals subquadrately oblong ascending petals linear acute lip not longer than the sepals side lobes very *Blume Bydr* 402 H *ah Cat Bomb Pl* 201 *id* 295 *Wight Ic* t 920 *andl in Wall Cat* 7052 *& Sp Orchid* 295 Orc itea *Sm Exot Bot* t 100 O altissima *Herb Ham*

TROPICAL HIMALAYA from Garwhal eastwards the KHASIA, NAGA and MUNNIPORE HILLS BURMA and the DECCAN PENINSULA to TRAVANCORE —DISTRIB China Malay Islands

Stem 2–4 ft tubers 3 4 in long *Leaves* 2–6 in imbricating up to the

Platanthera in want ng the produced stigmatic proces es and the obscure rostellum which is marked by a triangular line only

16 **H. pectinata,** *Don Prodr* 24 leaves ovate lanceolate, spike

H Geraldiana *Wall Cat* 7051 H cushiona *Lindl Gen & Sp Orchid* 321 Orchis pectinata *Smith Exot Bot* t 99

TEMPERATE HIMALAYA from Simla alt 5–8000 ft eastwards ascending to 9000 ft in Sikkim KHASIA HILLS

Stem 1 2 ft robust very leafy *Leaves* 4–6 in strongly 3 nerved upper or all

cells rather divergent tubes short, glands of pollinia small, stigmatic processes elongate, tips often falcate dilated and upcurved, rostellum obscure *Capsule* ¾ in, sessile, fusiform, ribs thick —Black when dry

17 **H. arietina,** *Hook, f* habit and foliage of *H pectinata*, but petals pubescent broader than the dorsal sepals gibbously dilated on the outer (lower) margin, spur rather longer than the ovary H pectinata, *Lindl Gen & Sp Orchid* 341, *Wall Cat* 7029 B *in part* and C

TEMPERATE HIMALAYA, from Simla eastwards, alt 5–8000 ft and to 10,000 ft in Sikkim KHASIA HILLS, alt 5–6000 ft

So similar in a dried state to *H pectinata* as to be with difficulty distinguishable, and though separated by Lindley perhaps only a variety Unfortunately Lindley in describing both species gave Don's name to the wrong plant, as I have proved by examining *Smith's original specimen of O pectinata in his Herbarium* at the Linnean Society, which is of a very small state —Black when dry

18 **H. intermedia,** *Don Pr dr* 24, leaves ovate or oblong acuminate, flowers few very large, dorsal sepal recurved lateral reflexed narrower than the dimidiate obovate falcate glabrous petals lip longer than the sepals spur twice as long as the ovary *Lindl Gen & Sp Orchid* 322, *Wall Cat* 7030, *Reichb f in Gard Chron* 1879, 136

TEMPERATE HIMALAYA, from Kashmir to Sikkim alt 5 7000 ft

Stem 8–10 in *Leaves* 2 4 in scattered 5–7 nerved base rounded or cordate *Racemes* few fld, bracts broad equalling the ovary, flowers 2 in diam white or greenish, lateral sepals falcately lanceolate acuminate, reflexed 5 nerved, petals strongly 5 nerved, spur very stout, anther-cells with long erect filiform tubes, *glands of pollinia small, stigmatic processes long, slender incurved, rostellum* adnate to the face of the column between the anther-cells *Capsule* 1½–2 in, pedicelled, fusiform, beaked, terete

19 **H. trichosantha,** *Wall Cat* 7028, leaves ovate oblong or lan [illegible] n the long decurved narrow ovary, [illegible] ate acuminate puberulous, petals [illegible] the sepals, side lobes capillaceo [illegible]

BURMA, at Taongdong *Wallich*, Moulmein, *Parish*, Attran, *Brandis* (in *Herb Calcutt*)

Stem 8–18 in *Leaves* few, 3–6 in, 5–7 nerved *Raceme* 4–10 fld; ovary 1 in, sessile; lateral sepals ⅓ in, deflexed petals dilated upwards, entire or serrulate 1 nerved; spur 1½ in; anther-cells short, with short *free tubes, pollinia* much shorter than their caudicles, glands small, stigmatic processes short, globose, rostellum an obscure plate between the anther-cells *Capsule* 1 in, fusiform, shortly beaked, deeply channelled

** Side lobes of lip petaloid, outer margins entire, toothed, or fimbriate, midlobe narrow

† *Lip deeply 3-lobed or -partite, not or hardly longer than the lateral sepals*

20 **H. geniculata,** *Don Prodr* 25, stem tall leafy with many slender sheaths above, lateral sepals acute petals linear oblong, lip suborbicular, side lobes cuneate or rounded fimbriate or crenate, spur longer than the beaked ovary geniculate Platanthera geniculata, *Lindl in Wall Cat* 7012 —Habenaria, *Griff Notul* iii. 106, *Itin notes*, 31, No 494, *Ic Plant Asiat* t. 340

SUBTROPICAL HIMALAYA, from Nepal eastwards KHASIA and NAGA HILLS, alt. 2–5000 ft. BURMA, *Wallich*

beaked, deeply grooved and thickly ribbed.

21 **H. Richardiana,** *Wight Ic* t 1713, stem rather slender sheathed above, leaves oblong lanceolate, spike few- and lax fld, sepals ovate acuminate glabrous, petals gibbously triangular subacute, lip cuneate strongly nerved, side lobes narrow deeply toothed, spur stout twice as long as the beaked ovary

NILGHIRI and TRAVANCORE HILLS, alt 6–8000 ft, *Wight*, &c

Stem 6–8 in *Leaves* often subradical, 4–6 in, cauline much smaller, or reduced to sheaths *Spike* 8–10 fld, bracts large, lanceolate, shorter than the curved

22 **H. cephalotes,** *Lindl Gen & Sp Orchid* 322, stem short stout closely sheathed above, leaves short broad, spike dense fld, lateral sepals obliquely ovate and shorter broad gibbous petals and lip scurfily pubescent within, lip cuneately obovate, side lobes fimbriate, spur shorter than the beaked ovary *Wight Ic* t 1711

NILGHIRI and TRAVANCORE HILLS alt 7–8000 ft, *Wight*

Habit and foliage of *H Richardiana*, but stouter, stem more densely sheathed,

short broad

23 **H. polyodon,** *Hook f*, stem short stout sheathed above, leaves ovate-lanceolate, spike many-fld, bracts sheathing as long as the ovary, sepals obtuse glabrous, petals triangular-ovate obtuse, lip broadly obcordate, side lobes erose or pectinately fimbriate, *spur very stout exceeding* the stout curved ovary H fimbriata, *Wight Ic* t 1712

NILGHIRI HILLS, *Wight*, &c

Stem 8–10 in, leafy to the top, tubers large *Leaves* 2 3 in, sheathing, upper cymbiform *Spike* 3 4 in, lax- or dense-fld, flowers ⅔ in diam, bracts cymbiform, sepals broadly ovate obtuse, dorsal smallest, petals smaller, triangular, fleshy, midlobe of lip short oblong spur clavate, anther broad, cells subparallel, tubes short ascending, pollinia longer than their caudicles, gland minute, stigmatic processes very large, short, stout, rostellum very short, broad

24 **H. longicornu,** *Lindl in Wall Cat* 7027, *Gen & Sp Orchid* 322 (longicornis), leaves subradical linear oblong or lanceolate acuminate, spike lax fld, bracts shorter than the ovary, lateral sepals ovate acute glabrous, petals lanceolate or linear oblong, lip tripartite, side lobes recurved cuneate fimbriate or crenate, spur stout twice as long as the very long-beaked ovary H montana, *A Rich in Ann Sc Nat Ser* II XV. 73, *Wight Ic* t 925 and t 1714, *centre figure* and *lower right hand flower* Orchis longicornu, *Herb Heyne*

near oblong rarely (*as figured by* ...pper half of ovary almost filiform; ... than the linear midlobe, mouth of ... lobes rather long spreading pollinia as long as their caudicles, stigmatic processes short, clavate, rostellum low, broad

25 **H. platyphylla,** *Spreng Syst Veg* iii 690 scapigerous leaves sessile orbicular or elliptic, spike short dense fld, bracts shorter than the long beaked ovary, sepals broadly oblong obtuse petals linear narrow, lip 3 lobed, side lobes small rounded midlobe lanceolate, spur longer than the ovary slender *Lindl Gen & Sp Orchid* 323, *Grah Cat Bomb Pl* 201, *Wight Ic* t 1709 Orchis platyphyllos *Willd Sp Pl* iv 10, O plantaginea, *Roxb Cor Pl* 32, t 37, *Fl Ind* iii 450 O Roxburghii, *Pers Syn* ii 503

subglobose, rostellum short triangular

26 **H. Lindleyana,** *Steud Nomencl Ed* 2 716, leaves subradical

shorter and narrower than the linear oblong obtuse midlobe spur filiform longer than the ovary H latifolia, *Lindl Gen & Sp Orchid* 323

MALAY PENINSULA (*Ic Finlayson in Herb Kew*)

Leaves 5 6 by 2 2½ in, membranous, almost petioled, many nerved *Scape*

27 **H. suaveolens,** ...
subradical linear or li...
flowers secund bracts ...
nate, sepals subequal ...
side lobes broad, midlo...
ovary, tip subclavate

The CONCAN, between Vignorla and Malwan rare *Dalzell*

Leaves 1-[illegible] by [illegible] in, rather thick *Scape* 6-12 in, often flexuous, sheaths 1-3 in, bracts [illegible] in long finely acuminate, herbaceous; flowers 3-6 [illegible] in broad, white, jasmine scented; dorsal sepal orbicular-ovate, obtuse, lateral subfalcate, ovate-oblong, acute; petals triangular-ovate, subacute, lip as long as the lateral sepals as broad as long side lobes toothed or entire; anther narrow, erect, apiculate, cells contiguous narrow, tubes 0; pollinia clavate, as long as their stout caudicles,

glands large orbicular, lying close together on each side of the erect acute rostellum; (stigmatic processes short, truncate, *Dalzell*) —A very anomalous species of this section.

†† *Lip deeply 3 lobed or -partite, much longer than the lateral sepals*

28 **H. longifolia,** *Ham in Lindl Gen & Sp Orchid* 324, stem tall slender leafy, leaves very narrow, spike few- and lax fld, bracts slender longer than the slender beaked ovaries, sepals small, petals gibbously ovate, lip flabelliform, side lobes semi-circular quite entire, spur slender twice as long as the ovary Gymnadenia longifolia, *Lindl in Wall Cat* 7060

WESTERN HIMALAYA, Kumaon, *Royle*, Nepal, at Nathpur, *Hamilton*

Stem 10–18 in. *Leaves* 3–5 in, scattered, erect, linear, acuminate *Spike* 2–3

processes short, clavate, incurved, surrounding the mouth of the spur, rostellum long, subulate, erect

29 **H. plantaginea,** *Lindl Gen & Sp Orchid* 323, scapigerous, leaves narrowly oblong, scape slender, spike lax-fld, bracts half as long as the beaked ovary, sepals small, petals linear lanceolate, lip flabelliform, side lobes semi ovate entire or toothed, midlobe as long linear, spur as long as the ovary very slender *Wight Ic* t 1710 Gymnadenia platyphylla, *Lindl in Wall. Cat* 7053 Orchis platyphyllos, *Roxb Fl Ind* iii 609 O tenuis, *Herb Rottl*

SUBTROPICAL HIMALAYA, alt 3–7000 ft, from Garwhal to Sikkim BEHAR, CENTRAL INDIA, and the DECCAN PENINSULA, from the Concan southwards, *Heyne*, &c CEYLON, in the hot drier parts of the Island

Leaves 3–6 in, radical, horizontal, acute or obtuse, membranous *Scape* 8–12 in, slender, sheaths small, acuminate, spike 2–3 in, flowers subsecund, white, bracts setaceous or lanceolate, ovary ⅓ in, curved, sepals ⅙ in long, subequal acute, 3-nerved, dorsal ovate-oblong, lateral falcately oblong, lip ⅓–½ in broad, twice as ... 1–1½ in green, anther rather broad, cells as long as their caudicles, glands elongate; ... llum triangular, broad *Capsule* ¾ in, ... ider —In this species the caudicles of the ... w of a single concave 2-lipped or incurved gland of a lanceolate form, which afterwards splits longitudinally, each pollinia carrying away one half

30 **H. longicalcarata,** *A Rich in Ann Sc Nat Ser* 2, xv 71, t 3, subscapigerous, leaves linear oblong or lanceolate, flowers 1–4, bracts

H decipiens, *Wight Ic* v Pt. i 14 H montana, *Wight Ic* t 1711 (*upper right and left hand figures*) (*not of A Richard*) H longicorniculata, *Grah Cat Bomb Pl* 202 H macroceratitis, *Herb Rottl*

The DECCAN PENINSULA, on the Western Ghats, from the Concan to Travancore, ascending to 6000 ft

Stem or *scape* 10–18 in, sheaths few, distant *Leaves* 2–4 in *Flowers* white, jasmine-scented, bracts ¾–1 in, ovary 1 in, suberect, its pedicel sometimes as long; sepals ½ in. long, 3 nerved, lip ¾–1 in long, spur thickened from below the middle to

31 **H. crinifera,** *Lindl Gen & Sp Orchid* 323, scapigerous, leaves oblong or lanceolate raceme lax fld, bracts much shorter than the

schizochilus *Grah Cat Bomb Pl* 282 Symmeria schizochilus, *Grah l c on last (unnumbered) page*

The DECCAN PENINSULA, from the Concan to Travancore CEYLON

Leaves 1 6 in, very variable in breadth *Scape* 1–18 in, very slender, sheaths scattered, subulate bracts lanceolate flowers white, ¾ 1¼ in long, dorsal sepal

very short, obtuse

32 **H. triflora,** *Don Prodr* 25, stem leafy 1–2 fld, leaves short sheathing, bracts long embracing the ovaries of the large erect flowers, dorsal sepal oblong ovate lateral oblong-lanceolate petals small linear-subulate, lip very large, side lobes semi-oblong hatchet shaped crenulate, midlobe shorter linear spur very slender as long as ovary straight. Platanthera candida, *Lindl in Wall Cat* 7035, *Gen & Sp Orchid* 2[illegible]5

[illegible] sepal,

W[illegible]

[illegible] in

br[illegible] [illegible]rtly

ped[illegible] [illegible]ect;

petals 1 nerved, lip 1 1⅓ in broad, sessile on the mouth of the spur, and there [illegible], spur slightly thickened at the tip, mouth funnel shaped, anther very broad, quadrate, truncate, cells margined, tubes short free, glands of pollinia minute, staminodes prominent, stigmatic surface inconspicuous; rostellum broad obscure—The suberect lateral sepals, and sheathed stem recall the species of the *Phyllostachya* section

*** *Lip short, 3 lobed at the broad apex*

33 **H. Orchidis,** *Hook f*, stem stout leafy, leaves oblong or linear-oblong erect acute, spike short cylindric very dense-fld., bracts longer than the short curved ovaries, flowers small, sepals puberulous, dorsal elliptic, lateral oblong, petals shorter rhombic-orbicular, lip cuneately obovate, spur as long as the ovary slender incurved Gymnadenia cylindrostachya, *Lindl in Wall Cat* 7056, *Gen & Sp Orchid* 278 G Orchidis, and violacea, *Lindl Gen & Sp l c* Platanthera Orchidis, *Lindl in Wall Cat* 702[illegible] A

TEMPERATE HIMALAYA; Garwhal, alt 8 9000 ft, *Duthie*; Kumaon, *Wallich*; Sikkim alt 8 1000 ft, *J D H.*

Stem 1 2 ft *Leaves* 2 6 in, broad or narrow, sheathing, sometimes short and imbricating *Spike* 2 5 in; bracts lanceolate, herbaceous, ovary ⅓ in long, incurved, subrostrate, flowers ⅓ ½ in diam, pink, odoriferous, perianth spreading;

dorsal sepal oblong, lobes of strongly nerved lip very short, obtuse, equal or the midlobe longest and broade t, anther short, broad, cells parallel contiguous tubes 0, pollinia clavate almost sess le on the large oblong gland, grains very large and loose, stigmatic processes very l rge globose, placed close under the anther, and swelling up after fertil zation so as almo t to cover it, rostellum minute *Capsule* small sessile, ½ in long, broadly ellipsoid or subglobose —A very anomalous member of the section

34 **H. monophylla,** *Collett & Hemsl in Journ Linn Soc ined*, leaf solitary subradical, stem and many fld raceme scurfily pubescent, bracts as long as the ovary or shorter, sepals and petals subequal oblong obtuse glabrous, lip much larger than the sepals clawed cuneately obovate *3 lobed lateral lobes broad erose, midlobe smaller ovate obtuse, spur as* long as the lip incurved obtuse

UPPER BURMA *Collett*

A foot high rather slender *Leaf* 2 in, oblong obtuse sheathing the base of the stem *Stem* flexuous she ths 2 3 ½ in, and bracts lanceolate, acuminate *Raceme* 2 in, rather dense fld, bracts ⅓ in, flowers about as broad as long, side lobes of lip as broad as long diverging d sk puberulous speckled, anther ovoid or globose cells parallel contiguous tubes 0 glands of pollinia contiguous orbicular —Closely allied to *H Orchidis* Described from a single indifferent specimen

Sect III TRIMEROGLOSSA (See p 132)

* Tubes of the anther cells long

† *Perianth membranous, lateral sepals with deeply looped or arched nerves*

35 **H. commelinifolia,** *Wall in Lindl Gen & Sp Orchid* 325, tall, robust, leaves oblong to oblong [illegible]

TROPICAL WESTERN HIMALAYA, Kumaon, alt 3000 ft, *Royle, Strachey & Winterbottom* The CONCAN and CANARA *Stocks Law*, &c

Stem 2–3 ft, tubers ellipsoid (2 9 in long *Roxb*) *Leaves* 3 6 in, upper or sheaths lanceolate *Spike* 4–8 in, ovary 1–1½ in upper two thirds filiform, flowers ½–⅔ in diam, white inodorous, mid segment of l p deflexed, scaberulous, lateral widely spreading, spur 1–2½ in, incurved green, mouth funnel shaped, antl er reflexed, tubes long stra ght erect, staminodes seated on the long arms of the column, stigmatic processes large, clavate incurved, rostellum short, triangular *Capsule* ¾ in, sessile, fusiform, beak twice as long as the body

36 **H. mollifera,** [illegible]

globose or clavate

SIKKIM HIMALAYA, at Senalah, alt 6000 ft *King (Herb Calcutt)* KHASIA HILLS, *Lobb*, at Myrung, alt 5000 ft, *J D H & T T*

Stem th raceme 12 18 n ha rs cellular s attered *Leaves* clustered below the m ddle of the ste n 5–8 by 1½–2 n *Raceme* 4–6 n lax fld sheaths large ovate finely acun nate br cts ¾ 1 n shorter than tl e o a y ovate lanceolate ry ¾ 1 n beak very s ender dorsal sep l tr an ul r oblong n outl ne but v th the obtuse false apex to tl e 5 nerved sepal tl e end be ng close to the b se of the sepal petals g bbousl tr an ar stam nod s adnate to the s des of th anther antl er recumbent tub s very long decu ved po l n a clavate caud cle ery long glands m nute s gmat c p ocesses very long ostellum obscure

37 **H Murtoni** *H k f* ... of the stem ob much smaller longer than th or lateral shorter spur longer than the long beaked ovary slender

MALAY PENINSULA Perak on l me tone rocks *Sco tech n Kunstler* SINGAPORE *Murton*

St 2–3 ft w tl rather close set ovate lanceolate leafy sheaths 1 2 n long

than the r long caud cles glands m nute st gmat c processes globose rostellum obscure

38 **H Kingii,** *Hook f* robust leaves large crowded towards the base of the stem pet oled spike puberulous dorsal sepal obovate cucullate as long as the cultriform beaked strongly falcate lateral petals l near lanceolate obtuse l p much longer than the sepals tr partite to the base segments very slender subequal spur as long as the slender long beaked ovary

PERAK on l mestone rocks *K ng s Collector*

Stem 1 2½ ft *L aves* 5–10 in acu e or acum nate *Sp ke* lax fld bracts

l p a s

and spu Botl th se and *H furf acea* a e near *H c olar s* Kranz e n of China and *H mur cata* V dal of the Pl l pi ne Isl nds.

39 **H furfuracea,** *Hook f* tall leaves large obovate or oblanceo short cellular ha rs dorsal as the cultriform strongly base spur shorter than the

40 **H pubescens,** *Lindl Gen & Sp Orcl d* 322 stem leafy towards the base and elongate many fld raceme pubescent leaves ell pt c lanceolate base narrowed dorsal sepal hem spheric nearly as long as the dim d ate ovate obtuse lateral petals linear l p much longer than the

sepals tripartite, segments linear obtuse central broadest, spur slender as long as the curved beaked ovary tip acuminate

WESTERN HIMALAYA, Kumaon or Garwhal, *Royle, Falconer*

Stem 12-18 in, stout; upper sheaths free, ovate-lanceolate *Leaves* 4-6 by 1-1½ in, not margined *Spike* 8-10 in, bracts ovate lanceolate, ciliolate, shorter than the ovary which is curved, ½ in, pubescent, beak slender, lateral sepals ⅙-¼ in long, tubes of anther-cells long, straight, staminodes large, stigmatic processes globose —Much the smallest flowered of its subdivision

41. **H. spatulæfolia**, *Par & Reichb f in Trans Linn Soc* xxx 140, leaves 2-3 subradical obovate spathulate, scape slender 2 fld, sheath and bracts large broad cymbiform, dorsal sepal hemispheric as long as the hatchet-shaped lateral, petals linear oblong falcate, lip tripartite to the base, segments filiform side ones short central very long incurved, spur longer than the ovary tip clavate

TENASSERIM, at Mergui, *Parish*

Leaves 4-5 by 1 1½ in, not margined, subpetioled *Scape* as long, sheath subsolitary, bracts much shorter than the filiform straight beaked pedicelled ovary which is 1½ in long, sepals ½ in long, tubes of anther cells very long, slender, stigmatic processes short —Habit of *Diplomeris*

†† *Lateral sepals curved or nearly straight, nerves straight or moderately arched*

42 **H. pterocarpa**, *Thwaites Enum* 309, stem leafy, leaves long [illegible]

[illegible]

3 cleft to above the middle, side lobes subulate lanceolate falcately recurved longer than the straight midlobe, spur very large thrice as long as the beaked ovary thickened from below the middle

CEYLON, at Kandy, *Walker* at Ramboda, alt 3000 ft, *Thwaites*

Stem 6 18 in *Leaves* 4 10 in, base contracted *Spike* 3-10 fld, bracts large, ovate lanceolate, ovary narrowly winged, shortly pedicelled, flowers 1½-2 in diam, white, ovary 1½ in long, lateral sepals spreading or deflexed, dorsal rather shorter acute as long as the petals, spur 3½ in, green, narrowly clavate mouth with a tooth, midlobe with deflexed sides, anther cells divaricate, caudicles of pollinia exactly as in *H longicalcarata*, stigmatic processes elongate, clavate, rostellum triangular.

43 **H. rhynchocarpa**, *Hook f* stem leafy leaves lanceolate, spike short dense fld, dorsal sepal cymbiform half as long as the broadly ovate-oblong lateral, petals linear, lip as long as the sepals 3-lobed to the middle, lobes linear-lanceolate acute mid one longest spur much longer than the long slender beaked ovary ? H stenopetala *Lindl Gen & Sp Orchid* 324 (*not of p* 319) Platanthera rhynchocarpa, *Thwaites Enum* 310

[illegible], *Thwaites*

[illegible] *Leaves* 2-6 in, sessile *Spike* 2-3 in, [illegible] ovary or longer, flowers white, ½ ⅔ in [illegible] spur 1-1½ in, cylindric, green, obtuse, anther-cells divaricate, tubes straight, glands of pollinia minute, stigmatic processes elongate, incurved, adnate to the mouth of the lip, rostellum minute — Lindley's *H stenopetala* of p 324 (not of p 319) is I think a starved specimen of *rhynchocarpa*

44 **H. vidua,** *Par & Reichb f in Trans Linn Soc* xxx 140 t 27, f. 2, leaves subbasal elliptic lanceolate acute, scape above and flowers ... than the ovary, dorsal ... *he* of long subacute lateral, ... filiform subequal longer than the sepals side ones recurved over the flower, midlobe deflexed, spur longer than the long beaked ovary acute

TENASSERIM; at Moulmein *Parish*

Stem short, stout with 1 2 spreading sheaths above the leaves *Leaves* 3 5 by ⅓ 1½ in *Raceme* 4 6 in bracts ovate acuminate, flowers ½ in diam, green and white sweet scented, pedicel with ovary ¾–1 in nearly straight lateral sepals reflexed, margins revolute, spur thickened below, tubes of anther cells divaricate, pollinia much shorter than their slender caudicles glands small, stigmatic processes short clavate adnate to the mouth of the spur, rostellum short broad *Capsule* ¾ in, shortly pedicelled straight fusiform, beak short

45 **H Mandersii,** *Hemsl & Collett in Journ Linn Soc ined* tall, lower leaves linear oblong upper narrow lanceolate raceme glabrous ... sepal ... as the ... partite ... midlobe

BURMA at Mandalay *Anderson (in Herb Calcutt), Collett*

Stem with raceme 18 in *Leaves* (imperfect) 3 in upper narrow ones erect, ...

pollinia much shorter than their long narrowly winged caudicle glands ovate, stigmatic processes clavate —The organ at the mouth of the spur is very curious

46 **H rostrata,** *Wall in Lindl Gen & Sp Orchid* 325 leaves lanceolate acuminate upper passing into many slender erect sheaths, spike many and lax fld dorsal sepal cymbiform much shorter than the broadly ovate falcate lateral petals broadly oblong obtuse lip much longer than the sepals segments very long filiform spur shorter than the very long beaked ovary, tip pyriform Platanthera rostrata *Lindl in Wall Cat* 7031 A

PEGU and TENASSERIM *Wallich*

Stem 6–12 in *Leaves* 4 6 by ½ ¾ in *Spike* 2–4 in bracts very slender, ... about ⅓–¼ in ... tips turned ... of anther cells ... forming a *Young fruit*

47 **H. acuifera,** *Wall in Lindl Gen & Sp Orchid* 325 slender, leaves scattered linear lanceolate acuminate upper setaceous, spike short, ...

... as long as the ovary ... (excl Tab Ceylon)

Platanthera acuifera *Lin ll ı ı W ıll Cat* 7015 P rostrata *Lindl ı ı Wall Cat* 7051 B

KHASIA HILLS alt 4 5000 ft common NAGA HILLS *Prain* TAVOY, *Wall ch* —DISTR B Cl na

Stem 10–18 ın flexuous *Leaves* 2–4 by ın erect base sheath ng upper and

48 **H. chlorina,** *Reıcl b f ın Tra ıs L ı ı Soc* xxx 140 habit and character of *H acu fer ı* but rather sto ıter leaves broader spike longer sepals and petals 3 nerved side lobes of lip large and spur incurved below the middle with a large clavate ellipsoid tip

TENASSERIM at Moulme n *Lobb Parish* SHAN STATES alt 4100 ft *Collett*

Leaves n broad *Spı e* 2 3 long flo vers at first yello v green then spotted w th bro vn at last b o n —I robably a form of *H ac fera* but bes des the above d fference the flo ve s are smaller

** Tubes of anther cells short

† Stem leafy upwards

§ *Bracts l ınceolate acu ıınate Flowers not or l ar lly secund*

49 **H. elliptica,** *Wıgl t Ic* t 1706 leaves all linear oblong or lanceolate acuminate narrowly margined spike many fld bracts longer th e l ha or oa l l sepal shorter than the broadly oblong ıholate lip as long as the sepals obtuse spur stout equalling the

TRAVANCORE o tl e Pulney Mt *Wight*

Stem 12 18 ın rather stout *Lea es* 2 3 by ½ ¾ upper short sheath ng erect or incur ed *Sp ke* 1 ın cyl ndr c bra ts finely acum nate flowers

bro d tr angular

50 **H fusifera,** *Hook f* leaves oblong acute narrowly margined sp ke many fld br cts longer tl an the ovary dorsal sepal suborb cular nearly as long as but broader th ın the oblong obt ıse lateral petals larger tl an the sepals triang ılar ovate lip larger than tl e sepals 3 p rtite to the bas side segments filiform longer tl an the linear mid segu ent spur sl orter than the curved ovary fu iform with a short narrow ne k

TRAVANCORE on tl e A na mall y H ll *Beddome* n *Herb Calcutt*)

Hab t of *H ell p t ca* but very d fferent n the sho t r not b aked ovary larger dorsal sepal and p et l 3 par te l p and spur flow rs y llo v anther broad cells d v r cate tubes sl ort poll n la ate caud les l ort g ands small st mat c pro ses l t r al l te t t l f tl p l l s e n o ly o e p u

51 **H. trifurcata,** *Hook f*, leaves petioled elliptic lanceolate acuminate, spike many-fld, bracts equalling the ovary, sepals subequal ovate-lanceolate acute, petals narrowly linear, lip as long as the sepals 3-partite to near the base segments subulate, spur as long as the ovary or longer slender

KHASIA HILLS, at Nowgong (*Herb Calcutt*)

Stem 10–12 in, rather slender, leafless below *Leaves* 3–4 in, alternate, membranous, not margined, upper or sheaths lanceolate *Spike* many fld, bracts [illegible]

once from *H furcifera*, and the petals and spurs from *fusifera*

52 **H. avana,** *Hook f* leaves linear lanceolate acuminate, spike many fld, bracts longer than the flowers, dorsal sepal very broad, lateral oblong acute, petals as long triangular, lip longer than the sepals tripartite from beyond the base, segments linear subulate lateral incurved, spur as long as the short not beaked ovary

BURMA, at Ava, *Mrs Burney* (*Herb Calcutt*)

Stem 6–10 in *Leaves*, lower 2 in with long tubular sheaths, upper many erect very narrow *Spike* dense fld, lower bracts ¾ in, ovary ½ in, curved, sepals rather shorter, dorsal broadly ovate obtuse 5-nerved, lateral deflexed 3 nerved; petals 2 nerved, lip hardly twice as long as the sepals linear before forking, anther short, rather broad, tips of cells recurved hardly tubular, caudicles of pollinia very short glands large stigmatic processes long, clavate, adnate to the lip, rostellum broad, acute, flat —The specimens are indifferent

§§ *Bracts large, cucullate Flowers secund*

53 **H. Heyneana,** *Lindl Gen & Sp Orchid* 320, stem stout, leaves subimbricate short sheathing acute, bracts cymbiform acuminate sheathing the flowers sepals subequal obtuse, petals as long narrow, lip equalling the sepals 3 partite side lobes linear obtuse midlobe longer and broader, spur as long as the ovary or shorter straight subclavate *Wight Ic* t 923, 1703–4, *Dalz & Gibs Bomb Fl* 268 H glabra, *A Rich in Ann Sc Nat Ser* 2, xv 75, t 5 A Platanthera Heyneana, *Lindl in Wall Cat* 7044

The DECCAN PENINSULA, on the Ghats, from the Concan southwards, ascending to 7500 ft on the Nilghiris

Stem 6–10 in *Leaves* 1–1½ in, ovate, erect or recurved, rarely scattered and narrower *Spike* 2–4 in, bracts imbricating, lower 1 in long, ovary ⅓ in, not beaked, [illegible]
oblong, l [illegible]
or ovate [illegible]
linia ver [illegible]
cesses ve [illegible]
black in drying

54 **H. subpubens,** *A Rich in Ann Sc Nat Ser.* 2, xv 75, t 4 C, leaves linear or linear oblong scattered, bracts narrowly boat shaped acuminate, sepals subequal, petals as long falcate, lip spathulate clawed 3 fid, as long as the sepals, side lobes linear midlobe broader, spur as long as the ovary acute H candida, *Dalz in Hook Journ Bot* ii (1850), 262, *Dalz & Gibs Bomb Fl* 267

The SOUTHERN CONCAN *Perrottet Jacquemont Dalzell* and NILGHIRI HILLS &c

Very near *H Heyneana* and perhaps only a form of it but more slender leaves scattered l near 2 2½ in bases narrowed bracts narrower flowers white lip very different spur more slender anther apiculate glands of the pollinia approximate and even cohering oblong with the recurved sides stigmatic processes longer adnate to the claw of the lip —Does not turn black in drying

†† Leaves more than three c ustered towards the middle or base of the stem

55 **H. furcifera,** *Lindl Gen & Sp Orchid* 319 leaves ellipt c spike long many fld bracts as long as the ovary sepals subequal dorsal ng lanceolate subacute petals as sepals trifurcate side segments nt spur longer than the ovary *in Calc Journ Nat Hist* iv

TROPICAL HIMALAYA Car hal alt 2 3000 ft *Royle Edgeworth* BHOTAN *King* ASSAM *Wallich* ORISSA *Clarke* EAST BENGAL *Griffith*

Stem 10 18 in stout with l stant small sheaths above the leaves *Leaves* 4–6 by 1½ 2 in acute or acuminate base contracted not petioled *Spike* 5 7 in narrow bracts ovate lanceolate ovary ½ in curved hardly beaked sepals in long 3 nerved lateral reflexed petals as long membranous nerved anther rather small tubes pc rved ; stigmatic processes short *Capsule* in fus form turgid decurved r bat thick beak ½ as long as the body

56 **H affinis,** *Wight Ic* t 1707 leaves large elliptic lanceolate acuminate spike elongate cylindric bracts equalling or exceeding the

CENTRAL INDIA at Singboom *Clarke* The CONCAN and CANARA *Law Ritchie* &c TRAVANCORE on the Anamallay Hills *Beddome* (in Herb Calcutt)

Stem stout 1 2 ft clothed above the leaves h many erect lanceolate sheaths *Leaves* 4–6 by 2 2½ in hardly petioled not margined *Spike* 4–10 in rachis stout bracts ½–¾ in flowers gre ovary ½ in beak short sepal ¼ in 3 nerved l p t ce as long as the sepals anther broad cells parallel tubes shortly upcurved glands of pollinia small stigmatic processes large clavate —The Travancore specimen has broader segments of the lip than the northern ones

DECCAN PENINSULA o the Ghats from the Concan to the Nilghir

Tall 1 2 ft *Leaves* 2–3 6–8 by –4½ in se le or subpetioled acute or acuminate *Scape* l a leafy sheath below and slender ones above the leaves spike 10 in and under flowers d ant in d an green h bracts lanceolate nerves of sepals and petals obscure spur straight pe lulous anther short cells diverging tubes short upcurved caudicles of pollinia short glands small stigmatic processes clavate ; rostellum short broad

stout equalling the curved ovary or shorter inflated below *Lindl Gen & Sp Orchid* 320, *Dalz & Gibs Bomb Fl* 268, *Griff Notul* iii 371, *Ic Plant Asiat* t 341 *in Calcutt Journ Nat Hist* iv 382 Platanthera marginata, *Lindl in Wall Cat* 7038 H promensis, *Wall Cat* 7033, *Lindl Gen & Sp Orchid* 320 Orchis mysorensis and clavata, *Herb Heyne*

WESTERN HIMALAYA, from Kashmir to Kumaon, alt 5–7000 ft BEHAR and

beaked

The CONCAN, *Law*, &c

A much more slender plant than *H marginata*, turning yellow when dry, with fewer smaller flowers, and a more distinctly beaked ovary, but perhaps only a form of that plant.

60 H.

the scap

shorter

than the broadly oblong lateral, petals broadly obliquely ovate as long as the dorsal sepal, lip longer than the sepals 3 partite, segments slender, spur as long as the beaked ovary thickened below *Lindl Gen & Sp Orchid* 319, *Wight Ic* t 1705 H graminea, *A Rich in Ann Sc Nat Ser* 2, xv 73 (*not of Lindl*) H tenuis, *Griff in Calc Journ Nat Hist* iv 379, t 20, *Notul* iii 369, *Ic Plant Asiat* t 342 Orchis viridiflora, *Swartz in Act Holm* 1800, 206, *Willd Sp Pl* iv 13

LOWER BENGAL, *Griffith*, *Clarke* The DECCAN PENINSULA, in rice fields, *Heyne*, &c CEYLON, alt 5–7000 ft, *Walker*, &c

Tubers ovoid, ¾–1 in long *Leaves* many, 2–4 by ⅓–½ in, acuminate, nerves obscure *Scape* 4–14 in, slender, sheaths many and bracts lanceolate; raceme

Var *Dalzellii*, leaves radical linear 3 5 in, scape very slender wiry, flower rather smaller, spur longer than the ovary slender incurved Cœloglossum luteum

Dalz in Hook Journ Bot ii (1850), 263, *Dalz & Gibs Bomb Fl* 269 (*excl. syn*) —The Deccan Peninsula, Malwan, *Dalzell*, &c

61. **H. khasiana,** *Hook f*, scapigerous, leaves linear not margined, scape slender, raceme elongate, bracts much shorter than the ovary, sepals 3 nerved, dorsal nearly as long as the rather narrower lateral, petals as

KHASIA HILLS, in grassy places, alt 4–5000 ft, common

Leaves 3–4 by $\frac{1}{6}$–$\frac{1}{4}$ in, acute or acuminate *Scape* with elongate raceme 8–12 in, sheaths very few and bracts lanceolate, ovaries $\frac{1}{2}$–$\frac{3}{4}$ in, suberect, curved, shortly

and erect, and stout spur distinguish this

62. **H. [illegible]**

TENASSERIM, at Moulmein *Lobb*

Leaves as in *H khasiana* *Scape* with few-fld raceme 2–4 in, sheaths few, membranous, bracts $\frac{1}{4}$–$\frac{1}{3}$ in, ovate-lanceolate, flowers few, $\frac{1}{4}$ in broad, ovary $\frac{1}{2}$ in, sessile, curved, dorsal sepal obtuse obscurely 5-nerved, mid segment of lip shorter

††† Leaves 2, rarely 3, radical or opposite on the stem, sessile, broadly ovate cordate or oblong

63 **H. crassifolia,** *A Rich in Ann Sc Nat Ser* 2 xv 72, t 3 C,

The DECCAN PENINSULA, from the Concan to the Nilghiris common

Leaves 2–3, 1 1½ in diam *Scape* 6–12 in stout, sheaths many, finely acuminate

$\frac{1}{4}$ in diam, lobes of lip [illegible] cading, stig- [illegible] at taken by

64 **H. diphylla,** *Dalz in Hook Journ Bot* ii. (1850) 262, leaves radical orbicular cordate margined, raceme many fld bracts much shorter

than the ovary sepals ovate oblong subequal, petals as long linear, lip much longer than the sepals 3 partite segments filiform lateral longest, spur about equalling the ovary inflated acute *Dalz & Gibs Bomb Fl* 268 H Jerdoniana, *Wight Ic* t 1715 H Sutleri, *Reichb f in Linnæa* xxv 229 Platanthera canarensis *Lindl in Plant Hohenack exsicc*, No 142 Liparis diphyllos, *Nimmo in Grah Cat Bomb Pl* 252

WESTERN HIMALAYA Garwhal *Falconer* EASTERN BENGAL, Dacca *Clarke* The DECCAN PENINSULA from the Concan to Malabar

Leaves 1–2 in diam, thinly flesh [illegible]
small *Spike* 2 4 in narrow bract
½ in hardly beaked, dorsal sepal
broad, cells diverging, tubes very [illegible]
adnate to the mouth of the spur, rostellum obscure

65 **H. Aitchisoni,** *Reichb f in Trans Linn Soc Ser 2, Bot* iii

Hemsl in Journ Linn Soc xix 118

TEMPERATE HIMALAYA, Kashmir alt 7000 ft *Falconer* &c Kumaon, alt 9–12,000 ft *Duthie*, Sikkim alt 10–11,000 ft *J D H*—DISTRIB Affghanistan

Very variable in size and stoutness 10–18 in high *Leaves* inserted above the

Hongh 365 Listera reniformis, *Don Prodr* 28

[illegible] only allied to *H Aitchisoni*

Sect. IV. HOLOGLOSSA (see p 132) See also *H Mandersii* and *reniformis.*

* Stigmatic processes large

† *Stem leafy upwards*

67. **H. latilabris,** *Hook f*, leaves sessile ovate or oblong acuminate, spike many-fld, bracts green longer than the ovary, dorsal sepal broadest,

lip linear

Platanthe

289 P. l

TEMPERATE HIMALAYA, from Kashmir, alt 5–10 000 ft, to Sikkim, alt. 7–12,000 ft. CENTRAL INDIA, *Hope* (*Herb Clarke*)

Stem 6–18 in, stout or slender, leafy *Leaves* 3–5 in, usually sheathing *Spike* 3 10 in, lax fld, bracts ovate-lanceolate, lower leafy, ovary ½ ½ in, curved, flowers yellow-green, ⅓–½ in diam or more, sepals 3–5 nerved, glabrous or ciliolate, lateral spreading or deflexed, dorsal orbicular concave, petals as long as the lateral sepals, variable in shape, fleshy, lower base gibbous spur stout or slender, often involute and upcurved, anther-cells contiguous, tubes 0, caudicles of pollinia very short, glands small, stigmatic processes large, subglobose, rostellum short, triangular, obtuse *Capsule* ½ in, sessile, fusiform, shortly beaked, more or less curved or twisted —A very common and variable species in the Himalaya

68. **H. stenantha,**

..., alt 8 10 000 ft, *J D H, Clarke*

the lateral sepals and petals, being sharply deflexed, whilst laterally compressed The lip also is very narrow, but more so than in forms of *acuminata*, with which *stenantha* agrees in the column, anthers, pollinia, stigma and rostellum

69 **H. densa,** *Wall in Lindl Gen & Sp Orchid* 326, tall, stout, leaves many ovate or oblong acuminate base sheathing spike very long

flowers

sepals,

Wall

TEMPERATE HIMALAYA, from Simla to Sikkim, alt 5 9000 ft

Stem 1–3 ft usually much stouter than in any form of *H acuminata* or its allies *Leaves* 3 5 by 1–2 in *Spike* 8–14 in rather dense fld richly stout bracts ½–¾ in, finely acuminate, ovary ½ in stout curved, shortly beaked, flowers erect,

group

†† *Leaf solitary at or below the middle of the stem (rarely 2) Flowers subsecund. Rootstock or root branching (I think in all)*

70 **H. oligantha,** *Hook f*, stem slender naked above the usually solitary oblong leaf, bracts lanceolate herbaceous much longer than the flower usually divaricate, sepals and petals subequal, spur stout about as long as the shortly beaked ovary incurved clavate

SIKKIM HIMALAYA, in the interior valleys, alt 10-12 000 ft *J D H*

Stem 5–10 in *Leaf* sessile, 2 4 by ¾–1½ in, obtuse or subacute *Spike* 1½–4 in, lax fld, bracts spreading lower ¾–1 in green, upper gradually smaller, uppermost hardly exceeding the short sessile curved ovary, sepals ¼ in long oblong or oblong-lanceolate subacute, obscurely 3 nerved, subciliolate, petals as long, triangular lanceolate base of lower margin gibbous, lip linear lanceolate fleshy, anther cells parallel, tubes 0; pollinia pyriform, caudicles short, glands minute, stigmatic processes short, rostellum fleshy, triangular obtuse

71 **H. leptocaulon,** *Hook f* stem slender, with 2 3 narrow distant sheaths above the linear oblong acute leaf, spike slender few fld, bracts equalling the erect curved ovary, sepals and petals subequal, spur slender as long as the ovary incurved

SIKKIM HIMALAYA, Lachen Valley alt 10–11,000 ft *J D H*

Stem 8–12 in *Leaf* below the middle of the stem 1½–4 by ⅔ in, sheaths above the leaves 1-1½ in, linear lanceolate erect *Spike* 3–8 fld, 1–2 in rachis slender, bracts ⅓–½ in, erect slender, sepals ¼ in long 1-nerved lanceolate acute petals

long slender spur

72 **H. pachycaulon,** *Hook f* stem short very stout with 2 or 3 large herbaceous sheaths above the solitary oblong leaf, spike short dense fld, bracts herbaceous much longer than the flowers, sepals and petals subequal lip ovate lanceolate, spur equalling the ovary incurved clavate

SIKKIM HIMALAYA, Lachen Valley alt 12 000 ft, *J D H*, Nattong, *King's Collector*

[illegible]

73 **H. nematocaulon,** *Hook f*, stem very slender naked or with one or two sheaths above the small oblong subacute leaf, spike very slender lax fld, bracts half the length of the erect ovary, flowers minute, sepals erect and petals subequal, lip oblong lanceolate, spur very short clavate

f Sect Peristylus, to which this species is perhaps referable, but the branched ootstock, hal it, and habitat induce me to refer it here

** No stigmatic processes

74 **H. arcuata,** *Hook f*, st
anceolate, bracts herbaceous narrov
epal beaked, petals small linear
epals linear, spur many times longer than the ovary Platanthera arcuata, *Lindl Gen & Sp Orchid* 289

WESTERN HIMALAYA, *Royle*, Naini Tal, *Davidson*

Stem as thick as the little finger *Leaves* 3–4 in, oblong, subacute, upper anceolate, bases shea
ovary 1½ in, hardly
oblong, obtuse, 3-n
with rounded shoul
urved, acute, anth
short caudicles gla
remarkable species, with the lip of *Hologlossa*, but anther of the larger *Trimeroglossæ* I have seen but one specimen from Col Davidson, and a rude tracing in Herb Lindl, of Royle s plant

75 **H. sikkimensis,** *Hook f* stem stout leafy, spike elongate lax fld, bracts herbaceous longer than the large flowers, petals as large as the s spur rather

pike 3–4 in,
in, strongly
obtuse rather
shorter than
broad, cells r
caudicles gla
to *H acumin*
rostellum T
specimen seen

76 **H. concinna,** *Hook f Ic Plant ined* small stem many leaved, leaves small sessile erect ovate or oblong, spike many fld, bracts longer than the small flowers herbaceous lateral sepals linear longer and much narrower than the dorsal and petals lip linear from a broad base as long as the sepals, spur as long as the ovary slender incurved acute

KHASIA HILLS, at Kala pane, alt 7000 ft *J D H & T T Clarke*

Root of thick tuberous fibres *Stem* with spike 4–8 in *Leaves* almost imbricating, amplexicaul, lower 1–1½ in obtuse, upper gradually smaller acute, spike 2 in, rather dense fl, bracts ½ in ovate-lanceolate acute, ovary ½ in, suberect,

77 **H. zosterostyloides,** *Hook f* radical leaves long petioled elliptic acute, cauline sessile ovate cordate amplexicaul racemes long sparse fld, bracts as long as the ovary lateral sepals linear-oblong obtuse rather longer than the rounded ovate dorsal petals as large as the dorsal sepal triangular-ovate, lip linear as long as the sepals, spur as long as the ovary slender acute

MALAYAN PENINSULA, on Mt Ophir, *Griffith* (*Kew Distrib*, 5359), *Lobb*, PERAK, *Scortechini*, alt 7000 ft, *Wray*.

A remarkable species, in habit unlike any other The solitary long-petioled radical leaf, sometimes distant from the flowering stem, is very peculiar, and closely resembles that of *Cryptostylis* (Zosterostylis, *Blume*), *zeylanica*

Sect VI PERISTYLUS (See p 132)

* Spur as long the sepals, or longer, or shorter in *H aristata*

† *Leaves scattered along the stem, or radical* (*See also* 83 H Gardneri)

78 **H. bicornuta,** *Hook f*, leaves lanceolate or ovate-lanceolate, spike long many fld, bracts equalling or exceeding the ovary, lateral sepals linear obtuse, petals as long elliptic, lip tripartite, segments filiform, lateral longer than the sepals recurved over the flower, mid-segment shorter, spur longer than the sepals clavate or fusiform incurved Peristylus Richardianus, *Wight Ic* t 1097

The WESTERN GHATS; on the Nilghiri and Pulney hills, ascending to 6500 ft
Stem 1–2 ft, rather stout *Leaves* 2–3 in, sessile, acute or acuminate, 5–7-nerved *Spike* 6–10 in, rather dense-fld, bracts herbaceous, lanceolate, acuminate, lower ½–⅔ in, sepals ¼ in long, dorsal oblong obtuse sub 5-nerved, lateral erect at length spreading, petals 1-nerved, lip with a large concave claw, mid segment

79. **H. stenostachya,** *Benth Fl Hongk* 362, leaves lanceolate acuminate, spike narrow lax or dense-fld, flowers small, bracts equalling or exceeding the ovary, lateral sepals linear obtuse, petals larger than

... cernuum, ... t 1800, 200

SIKKIM HIMALAYA, *King* (*Herb Calcutt*), the KHASIA HILLS, TENASSERIM,

bracts ⅓–½ in, broadly ovate-lanceolate, finely acuminate, ovary ⅔ in, sepals ⅙ in. long, subequal, concave, lateral suberect, at length spreading, nerve very thick, produced into a point under the apex of the sepal; lip with a large excavate base, very variable in the length of the lobes, lateral spreading or recurved; anther

minute, cells parallel, tubes 0, pollinia short, grains large, caudicle and gland

80. **H. cubitalis**, ...

spur straight as long as the sepals nearly cylindric Platanthera cubitalis, *Lindl Gen & Sp Orchid* 292, *Thwaites Enum* 310 Orchis cubitalis, *Linn Fl Zeyl* 320

The KHASIA MTS, TENASSERIM, *Parish*, &c CEYLON, *Hermann*, at Pasdoon Corle, *Thwaites*

Stem with the slender spike 1–3 ft *Leaves* 2–6 in, sessile, flat, nerves obscure. *Spike* 8–12 in, bracts ovate-lanceolate, acuminate, lower ½ in, ovary ¾ in, erect, tip decurved, sepals $\frac{1}{12}$ in, obtuse, 1-nerved, nerve produced beneath the tip, dorsal longest and broadest, petals obliquely oblong, obtuse, lip with a short concave claw, later ... parallel, tubes 0, ... processes clavate, ... of the pollinia —Near *H stenosta* ..., ... much smaller There are two

†† *Leaves clustered round the middle of the stem (sometimes scattered in H Gardneri) Slender species, spike long lax fld*

81. **H. tipulifera**, *Par & Reichb f in Trans Linn Soc* xxx 139, leaves 4–6 linear lanceolate acuminate, bracts very slender equalling the slender ovaries, lateral sepals linear obtuse petals broader ovate oblong obtuse membranous, lateral segments of lip many times longer than the sepals capillary, mid one short subulate, spur clavate as long as the sepals ? Peristylus gracilis, *Blume Bijdr* 406

TENASSERIM, at Moulmein, *Parish*

Stem 1 2 ft, with appressed sheaths below the leaves, and 1–2 lanceolate ones above them *Leaves* 5 8 by ¾ 1 in clustered about the middle of the stem membranous, sessile *Spike* 6–10 in, flowers erect, small distant, bracts ½–¾ in, ... broad or ... minute, ... stigmatic ... ealing the ... it, erect — ... onger very slender ovary.

MALAYAN PENINSULA on Mt Oph r *Gr ffith (Kew D str b* 53o9) *Lobb* PERAK

reflexed l p elongate l ngu form obtu e anther broad cells d stant d vergent tubes hardly any poll n a sl orter than the r stout caud les glands large orb cul r st gmat c processes 0 rostellum very ob cure *Caps le* (nmatu e) sess le curved — A remarkable spec es n l ab t unl ke a y other The sol tary long pet oled rad cal leaf somet mes d stant from the flower ng stem is very pecul ar and closely resembles that of *Cryptostyl s* (Zosterostyl s *Bl me*) *eylan ca*

Sect VI PERISTYLUS (See p 139)

* Spur as long the sepals or longer or shorter in *H aristata*

† *Leaves scatte cd alo g tl e stem or rad cal* (See also 83 H Gardneri)

78 **H bicornuta,** *Hook f* leaves lanceolate or ovate lanceolate spike long many fld bracts equall ng or exceed ng the ovary lateral sepals linear obtuse petals as long ell pt c lip tripartite segments fili form lateral longer tl an the sepals recurved over the flowe mid seg ment shorter spur longer than the sepals clavate or fusiform incurved Peristylus Richardianus *Wight Ic* t 1097

The WESTERN GHATS on the N lgh and Pulney h lls ascend ng to 6000 ft

Stem 1 2 ft rather stout *Lea es* 2 3 in sess le acute or acun nate 5 7 n rved *Sp ke* 6–10 in rather dense fld bracts l erbaceou l nceolate acum nate lower ½ 2 n sep ls ½ n long dorsal ob ong obtu e sub 5 erved lateral erect at length sprea l ng petals 1 nerved l l w th a large concave cla v m d seg ent var able n length from tr angular to l near stra gl t obtu e spur stout anther

79 **H stenostachya,** *Benth Fl Hongk* 362 leaves lanceolate

Gen & Sp Orch d 30_ C peristyloides *Rc cl b f in Bonpland* 1856 91 C c rnuum *Rf l c* 1855 _0

SIKKIM HIMALAYA *l ng (Herb Calcutt)* tl e KHASIA HILLS TENASSERIM

l racts ½ ½ in broadly ovate lanceolate finely acu n nate ; ovary ½ n sepals ½ n l ng subequal concave lateral suberect at length sprea l ng rerve very tl ck produced nto a po nt under tl e apex of the sepal l p w th a large excavate base very var able l tl e length of tl e lobes lateral spread ng or recurved anther

minute, cells parallel, tubes 0; pollinia short, grains large, caudicle and gland

plant being sectionally a *Peristylus*, though Wight did not recognize it as such, and it is preoccupied by A. Richard for an Abyssinian species

80 **H. cubitalis,** *Br Prodr* 312, tall, slender, leaves scattered or subradical, linear oblong or lanceolate acute, spike long narrow, flowers minute, bracts as long as the curved ovary or shorter, sepals linear-oblong concave keeled, petals larger ovate-oblong, lip not exceeding the sepals 3-fid, side lobes spreading and recurved, midlobe shorter broad obtuse, spur straight as long as the sepals nearly cylindric Platanthera cubitalis, *Lindl Gen & Sp Orchid* 292, *Thwaites Enum* 310 Orchis cubitalis, *Linn Fl Zeyl* 320

The KHASIA MTS, TENASSERIM, *Parish*, &c CEYLON, *Hermann*, at Pasdoon Corle, *Thwaites*

Stem with the slender spike 1–3 ft *Leaves* 2–6 in, sessile flat, nerves obscure. *Spike* 8–12 in, bracts ovate-lanceolate, acuminate, lower ⅓ in, ovary ¼ in, erect, tip decurved, sepals $\frac{1}{12}$ in, obtuse, 1-nerved, nerve produced beneath the tip, dorsal longest and broadest, petals obliquely oblong, obtuse, lip with a short concave claw, lateral lobes shorter than or equalling the sepals, anther minute, cells

†† *Leaves clustered round the middle of the stem (sometimes scattered in* H Gardneri) *Slender species, spike long lax fld*

81 **H. tipulifera,** *Par & Reichb f in Trans Linn. Soc* xxx 139; leaves 4–6 linear-lanceolate acuminate, bracts very slender equalling the slender ovaries, lateral sepals linear obtuse petals broader ovate oblong obtuse membranous, lateral segments of lip many times longer than the sepals capillary, mid one short subulate, spur clavate as long as the sepals ? Peristylus gracilis, *Blume Bijdr* 406

TENASSERIM, at Moulmein, *Parish*

Stem 1 2 ft, with appressed sheaths below the leaves, and 1–2 lanceolate ones above them *Leaves* 5 8 by ¾ 1 in, clustered about the middle of the stem, membranous, sessile. *Spike* 6–10 in, flowers erect, small, distant, bracts ½–⅔ in.

... very slender, straight, erect — Very near *H. aristata*, differing in the long narrow leaves, and much longer very slender ovary.

broadly ovate fleshy obtuse or apiculate lip shorter than the sepals broad obtusely 3 lobed at the apex spur a minute globose sac

NAGA HILLS D UPPER ASSAM on Kohima *Prain* UPPER BURMA (*in Herb Calcutt*)

Stem 1° 18 in nak l below nd above excep for a few lanceolate sheaths *Leaves* 1½ 2 obtuse or acute ses le nerves obscure *Spike* 2–3 in., r ther den e fld bra ts subulate l ccol te acu i ate not h rbaceous lower ⅓ in ovary ¼ ⅓ in flo e s nearly lo zontal sepals ⅛–¼ in long ap culate behind the t p 1 nerved l p vitl a broad co icave cl v a tl er small short broa l, cells parallel, stigmat c processes ratl er lo g rostellu n m nute, 3 fid

89 **H. robustior,** *H* (*f* stem tall slender naked below leaves close s e passing into foliaceous imbricating

l

obtuse sp r very small lins *A R cl* ı *A* S *t* Ic t 1639 Gymnadenıa secu glossu n se undum *L* idl *G* *Herb Hey* ie a Sp *Orcl id* 303 Satyrum foliosum

MALABAR n tle B b bu a H lls *Heyne* NILGHIRI HILLS *Perrottet Lobb* TRAVANCO E ı tl I al y H lls *B ght*

Stem 1 ° ft so net es naked for a foot then leafy the leaves gradually l m n sl ng up v rds *Leaves* ° 3 u s berect or spreading bases sheath ng e vts ob cure *Spike* ° 6 bracts t v ce as long is tl e flo vers lo ver ¾ 1 n lono green ova es ⅓ ı lo nearly stra ght later l sepals ¼ in 1 nerved reflexed p tals t e r v s ı g 2 3 ne ved lip 2 auricled at the small concave cl w anth r cells par ll l st gmat c processes long rostellum 3 fi l between the cells *Capsule* ı oblo e ect —W gl t s fig ire of *P robustior* has tl e flowers large br cts shorter nd s de egments of l p much larger and more slender than in l s spec mens wh ch b ar the mss n ıne of *P persı ulıs*

90 **H Hamiltoniana,** *Hook f* stem tall slender naked below leaves linear lanceolate acuminate spike dense fld bracts filiform much longer than the minute flowers lateral sepals linear oblong obtuse petals broadly oblong l p shorter than the sepals broad shortly obtusely 3 lobed spur globose Herminium Hamiltonianum *Lindl in Wall Cat* 7069 Peristylis Hamiltonianus *Lindl Ge* ı *& Sp Orchid* 299 Orch s micranthema *Herb H* ı *n*

NEPAL n tle Mor ng *Han lton* SIKKIM HIMALAYA *Griffith s Collectors* (*Kew D strib* 5356) KHASIA MTS on Sl illong *Clarke*

Stem 6–12 n stout or sle ler elongate and sheathed below the leaves and w th one or two fil form sl eatl s abo e tl em *Leaves* 4–6 by ⅓–½ in or bro der some t nes overtopping t e sp ke ne ves ob cure *Spike* 3 6 in , bracts ¼–⅓ in often torto us (wl en dry) ov ry ⅓–⅓ n slender sul erect sepals ⅛ in 1 nerved nerve strong exc rrent be ow tle t p lors l oblong lip broadly cuneate base broad c ncave lobes vari ble sp r large for tl e size of the flower, bl ddery antler cells parallel glands of poll n a exposed on each s de of tl e minute rostellum st gmat c processes large clavate —Habit of *H robustior* but the flowers are much smaller the lateral sepals obtuse and the spur globose

†† *Leaves clustered abo it tl e middle of the stem*

91 **H gigas,** *Hook f* s em very stout and tall leaves ellipt c acuminate spike very many and dense fld , bracts membranous longer

inute, cells parallel, tubes 0, pollinia short, grains large, caudicle and gland
>scure, stigmatic processes clavate, rostellum erect, truncate, toothed, plicate, con-
aling the glands of the pollinia —Habit of *H viridiflora* In the Khasia specimens
ie midlobe of the lip is much longer than in the Peninsular I have had diffi
ilty in choosing a specific name, for Bentham, in adopting *stenostachya*, overlooked
ie older published one of *tenuis* That of *peristyloides* may be objected to from the
lant being sectionally a *Peristylus*, though Wight did not recognize it as such, and
is preoccupied by A Richard for an Abyssinian species

pur straight as long as the sepals nearly cylindric Platanthera
ubitalis, *Lindl Gen & Sp Orchid* 292, *Thwaites Enum* 310 Orchis
ubitalis, *Linn Fl Zeyl* 320

The KHASIA MTS, TENASSERIM, *Parish*, &c CEYLON, *Hermann*, at Pasdoon
Corle, *Thwaites*

Stem with the slender spike 1–3 ft *Leaves* 2–6 in, sessile flat, nerves obscure
Spike 8–12 in, bracts ovate lanceolate, acuminate, lower $\frac{1}{2}$ in, ovary $\frac{1}{2}$ in, erect,
ip decurved, sepals $\frac{1}{12}$ in, obtuse, 1-nerved, nerve produced beneath the tip,
dorsal longest and broadest, petals obliquely oblong, obtuse, lip with a short
anther minute, cells
obscure stigmatic
concealing the glands
ller There are two

†† *Leaves clustered round the middle of the stem (sometimes scattered in* H Gardneri) *Slender species, spike long, lax fld*

81 **H. tipulifera,** *Par & Reichb f in Trans Linn Soc* xxx 139, leaves 4–6 linear lanceolate acuminate, bracts very slender equalling the slender ovaries, lateral sepals linear obtuse petals broader ovate oblong obtuse membranous, lateral segments of lip many times longer than the sepals capillary, mid one short subulate, spur clavate as long as the sepals ? Peristylus gracilis, *Blume Bijdr* 406

TENASSERIM, at Moulmein, *Parish*

Stem 1 2 ft, with appressed sheaths below the leaves, and 1–2 lanceolate ones above them *Leaves* 5–8 by $\frac{3}{4}$ 1 in clustered about the middle of the stem membranous, sessile *Spike* 6–10 in, flowers erect, small, distant, bracts $\frac{1}{2}$–$\frac{3}{4}$ in,
broad or
ier minute,
stigmatic
cealing the
it, erect —
onger very

slender ovary

that of *Cryptostylis* (Zosterostylis, *Blume*), *zeylanica*

Sect VI PERISTYLUS (See p 132)

* Spur as long the sepals, or longer, or shorter in *H aristata*

† *Leaves scattered along the stem or radical* (*See also* 83 H Gardneri)

78 **H. bicornuta,** *Hook f*, leaves lanceolate or ovate-lanceolate, spike long many fld, bracts equalling or exceeding the ovary, lateral sepals linear obtuse, petals as long elliptic, lip tripartite, segments filiform, lateral longer than the sepals recurved over the flower, mid segment shorter, spur longer than the sepals clavate or fusiform incurved Peristylus Richardianus, *Wight Ic* t 1097

The WESTERN GHATS, on the Nilghiri and Pulney hills ascending to 6500 ft
Stem 1 2 ft rather stout *Leaves* 2–3 in, sessile, acute or acuminate, 5–7-nerved *Spike* 6–10 in, rather dense fld bracts herbaceous, lanceolate, acuminate, lower ½ ¾ in, sepals ⅙ in long, dorsal oblong obtuse sub 5 nerved, lateral erect at length spreading, petals 1 nerved, lip with a large concave claw, mid segment

79 **H. stenostachya,** *Benth Fl Hongk* 362, leaves lanceolate

Gen & Sp Orchid 302 C peristyloides, *Reichb f in Bonpland* 1856, 221. C cernuum, *Rf I c* 185, 250
SIKKIM HIMALAYA, *King* (*Herb Calcutt*), the KHASIA HILLS TENASSERIM,

ovary ½ in, sepals ⅙ in
nding, nerve very thick,
ith a large excavate base,
ding or recurved, anther

minute, cells parallel, tubes 0; pollinia short, grains large, caudicle and gland obscure; stigmatic processes clavate, rostellum erect, truncate, toothed, plicate, concealing the glands of the pollinia —Habit of *H viridiflora* In the Khasia specimens the midlobe of the lip is much longer than in the Peninsular I have had diffi
ng *stenostachya*, overlooked
may be objected to from the
ot recognize it as such, and

80. **H. cubitalis,** *Br P*
radical, linear oblong or la
minute, bracts as long as the
concave keeled, petals large
3 fid, side lobes spreading a
spur straight as long as the sepals nearly cylindric Platanthera cubitalis, *Lindl Gen & Sp Orchid* 292, *Thwaites Enum* 310 Orchis cubitalis, *Linn Fl Zeyl* 320

The KHASIA MTS, TENASSERIM, *Parish*, &c CEYLON, *Hermann*, at Pasdoon Corle, *Thwaites*

Stem with the slender spike 1–3 ft *Leaves* 2–6 in, sessile, flat, nerves obscure *Spike* 8–12 in, bracts ovate-lanceolate, acuminate, lower ½ in, ovary ¾ in, erect, tip decurved, sepals 1/12 in, obtuse, 1-nerved, nerve produced beneath the tip, dorsal longest and broadest, petals obliquely oblong, obtuse, lip with a short concave claw, lateral lobes shorter than or equalling the sepals, anther minute, cells parallel, tubes 0, pollinia short granular, caudicles and glands obscure, stigmatic processes clavate, rostellum erect, truncate, toothed, plicate, concealing the glands of the pollinia —Near *H stenostachya*, but flowers much smaller There are two forms in Ceylon, one with leaves scattered along the stem, and another also found in Tenasserim with radical leaves, the latter is,—

Var *brevifolia*, leaves very short 1–1½ in radical linear oblong Cœloglossum brevifolium, *Lindl Gen & Sp Orchid* 302 (*excl hab Nepal*) —Tavoy, *Wallich* Ceylon, *Walker & Gardn* Wallich's
by him, but are ticketed, "Tavoy, I
been put on the sheet by another hal
linifolia (*H khasiana* p 151) To
melinifolia (not *micrantha* as Lindley states in his Herbarium)

†† *Leaves clustered round the middle of the stem* (*sometimes scattered in H Gardneri*) *Slender species, spike long lax fld*

81. **H. tipulifera,** *Par & Reichb f in Trans Linn Soc* xxx. 139; leaves 4–6 linear lanceolate acuminate, bracts very slender equalling the slender ovaries, lateral sepals linear obtuse, petals broader ovate oblong obtuse membranous, lateral segments of lip many times longer than the sepals capillary, mid one short subulate, spur clavate as long as the sepals ? Peristylus gracilis, *Blume Bijdr* 406

TENASSERIM, at Moulmein, *Parish*

Stem 1 2 ft, with appressed sheaths below the leaves, and 1–2 lanceolate ones above them *Leaves* 5–8 by ½ 1 in clustered about the middle of the stem, membranous, sessile *Spike* 6–10 in, flowers erect, small distant, bracts ½–¾ in; ovaries as long, straight, sepals ⅛ in long 1 nerved, dorsal ovate-oblong broad ...

broadly ovate fleshy obtuse or apiculate, lip shorter than the sepals broad obtusely 3 lobed at the apex, spur a minute globose sac

NAGA HILLS in UPPER ASSAM, on Kohima, *Prain*   UPPER BURMA (*in Herb Calcutt*)

Stem 12–18 in, naked below, and above except for a few lanceolate sheaths *Leaves* 1½ 2 in, obtuse or acute, sessile, nerves obscure *Spike* 2–3 in, rather dense fld, bracts subulate-lanceolate, acuminate, not herbaceous, lower ½ in, ovary ½–⅓ in, flowers nearly horizontal, sepals ⅛–⅙ in long, apiculate behind the tip, 1 nerved, lip with a broad concave claw, anther small short broad, cells parallel, stigmatic processes rather long, rostellum minute, 3 fid

89 **H. robustior,** *Hook. f*, stem tall slender naked below, leaves close set ovate lanceolate acuminate passing into foliaceous imbricating

straight obtuse, spur very small ellipsoid or fusiform Peristylus lancifolius *A Rich in Ann Sc Nat Ser* 2 xv 69, t 2 C P robustior, *Wight Ic* t 1699 Gymnadenia secunda, *Lindl in Wall Cat* 7051 Cœloglossum secundum, *Lindl Gen & Sp Orchid* 303 Satyrum foliosum, *Herb Heyne*

MALABAR, in the Bababu an Hills, *Heyne* NILGHIRI HILLS, *Perrottet, Lobb* TRAVANCORE, in the Pulney Hills, *Wight*

Stem 1–2 ft, sometimes naked for a foot, then leafy, the leaves gradually diminishing upwards *Leaves* 2–3 in, suberect or spreading, bases sheathing, nerves obscure *Spike* 2–6 in, bracts twice as long as the flowers, lower ¾–1 in long green, ovaries ½ in long, nearly straight, lateral sepals ¼ in, 1-nerved, reflexed, petals nearly as long, 2–3 nerved, lip 2 auricled at the small concave claw, anther-cells parallel, stigmatic processes long, rostellum 3 fid, between the cells *Capsule* ½ in, oblong, erect —Wight's figure of *P robustior* has the flowers large bracts shorter and side segments of lip much larger and more slender than in his specimens, which bear the mss name of *P persimilis*

90 **H. Hamiltoniana,** *Hook f*, stem tall slender naked below, leaves linear-lanceolate acuminate, spike dense fld, bracts filiform much

a linear oblong obtuse, petals road shortly obtusely 3 lobed, *Lindl in Wall Cat* 7069 *Sp Orchid* 299 Orchis micranthema, *Herb Ham*

NEPAL, in the Morung, *Hamilton* SIKKIM HIMALAYA, *Griffith's Collectors* (*Kew Distr*

Stem 6–

one or two f

sepals ⅛ in, 1-nerved, nerve broadly cuneate, base broad, he flower, bladdery, anther-cells parallel, glands of pollinia exposed on each side of the minute rostellum, stigmatic processes large, clavate —Habit of *H robustior*, but the flowers are much smaller, the lateral sepals obtuse, and the spur globose

†† *Leaves clustered about the middle of the stem*

91 **H. gigas,** *Hook f*, stem very stout and tall, leaves elliptic acuminate, spike very many and dense-fld, bracts membranous longer

than the flowers, lateral sepals $\frac{1}{3}$ in long lanceolate acuminate, petals as long gibbously ovate obtusely acuminate, lip as long as the sepals obtusely trifid lobes subparallel, spur very shortly oblong.

shorter, capsule much longer.

92 **H. goodyeroides,** *Don Prodr* 25, stem 1–2 ft stout, leaves elliptic-oblong or lanceolate acute, spike elongate dense-fld, flowers sub-
'eral sepals $\frac{1}{4}$ in linear-
as long as the sepals
idl Gen & Sp Orchid
t 87, f 2 P grandis,
Blume Bydr. 405 Herminium goodyeroides, *Lindl in Wall. Cat* 7066

SUBTROPICAL HIMALAYA, from Kumaon to Bhotan, alt 2–5000 ft The

Spike 4–12 in, bracts lanceolate, membranous, flowers about $\frac{1}{3}$ in diam, very variable in size, yellowish green, sepals $\frac{1}{8}$–$\frac{1}{6}$ in, lip recurved, sessile, lobes very variable, spur subglobose fusiform or clavate, anther small, tubes very short, pollinia clavate, caudicles hardly any, glands small, stigmatic processes short clavate, rostellum erect, toothed *Capsule* $\frac{1}{2}$ in, sessile, fusiform, acute —The Ceylon habitat given by Thwaites no doubt refers to *H Wightii*, which has been confounded with this

93 **H. constricta,** *Hook f*, stem stout tall, leaves elliptic acute
than the
gibbous
e middle
side lobes slender longer than the midlobe, spur globose Platanthera constricta, *Lindl in Wall Cat* 7043 Herminium constrictum, *Lindl in Bot Reg under* t 1419 Peristylus constrictus, *Lindl Gen & Sp Orchid* 300 Orchis leucantha, *Herb Ham*

SUBTROPICAL SIKKIM, *J D H* KHASIA HILLS alt 2–4000 ft *J D H & T T*, &c. TENASSERIM,
Stem with spike 2–3 ft
petioled *Spike* 4–8 in,
lanceolate, lobes of lip
parallel, tubes short, pollinia clavate, caudicles short glands large, stigmatic processes clavate; rostellum 2 fid erect

94 **H. Parishii,** *Hook f*, stem short stout, leaves sessile ovate-oblong, spike narrow elongate, bracts linear lanceolate longer than the small flowers both erect, lateral sepals linear-oblong obtuse, petals broader ovate oblong, lip as long as the sepals shortly 3 lobed beyond the middle,

spur very short fusiform. Peristylus Parishii, *Reichb f in Trans Linn Soc* xxx 139

TENASSERIM, at Moulmein *Parish*

Stem below the leaves very stout 3 4 in laxly sheathed, above the stem 3–6 in, with 2–3 lanceolate sheaths *Leaves* 3–5 by 1½–2 in, acute or acuminate *Spike* 4–6 in, bracts ½–⅔ in with fil form tips and flowers appressed to the rachis, ovary ½ in, sepals ⅙ in, petals ovate cordate obtuse, lip very variable in form, broad or narrow, lobes short obtuse, or the middle one narrower and longer —Turns black in drying The specimens are not good Perhaps a form of *goodyeroides*

95 **H. Wightii,** *Trimen Cat Ceyl Pl* 91, tall, leaves oblong- . . . . . ise fld, bracts longer than . . ng obtuse dorsal shorter broad obliquely orbicular . . broad entire or shortly s, *Hook Bot Mag* t 3397 . . *Gen & Sp Orchid* 300, us, *Dalz in Hook. Journ*

The CONCAN, *Nimmo*, Malwan, *Dalzell*, &c TRAVANCORE, at Paul Ghat, *Wight* CEYLON, *Macrae*

Stem 1–2 ft, rather stout, loosely sheathed below the leaves and with lanceolate sheaths above them *Leaves* 5 7 by 2½–3 in, acute or acuminate *Spike* 4–8 in, bracts ½ in, lanceolate, ovary ½–⅓ in, flowers greenish white, sepals 1-nerved, lateral ⅙ in, apiculate below the lip, dorsal ⅓ in shorter, lip contracted beyond the very short broad concave base, anther rounded, cells parallel with short recurved tubes, pollinia clavate, caudicles very short, glands small solid, stigmatic processes short rostellum short, acute —Dalzell describes the petals as longer than the sepals I do not find the erect long narrow processes on each side of the anther figured in Bot Mag —The Travancore plant figured by Wight precisely resembles the Concan one

96 **H. Lawii.** . . . lanceolate, spike longer than the . sepals very broad spur small globose *& Gibs Bomb Fl* 270

BEHAR, on Parasnath, alt 4200 ft *Clarke* The CONCAN and MAISOR, *Law*, &c

Stem 6–10 in, loosely sheathed below the leaves *Leaves* 3–5 membranous 3–4 by 1 2 in, subpetioled acute *Spike* narrow, strict 2–3 in, lax fld, bracts ¼–½ in, . . .

97 **H. Brandisii,** *Hook f*, very slender, leaves scattered towards . . .

short, spur very short globose

PEGU, *Brandis* (*Herb Hort Calcutt*)

Stem with spike 20 in *Leaves* 3–5 in, membranous, upper smaller. *Spike* 8 in, very slender; bracts $\frac{1}{4}$ in, ovate lanceolate, flowers $\frac{1}{6}$ in diam, sepals and petals membranous, 1 nerved, lateral sepals deflexed, long segments of lip 1 in, ... [illegible] ... very short contracted neck ovary small with a thick

ollen grains

ct between

††† *Leaves few radical, or solitary and cauline*

98 **H. lacertifera,** *Benth Fl Hongk* 362, stem or scape stout or

KHASIA, NAGA and MUNNIPORE HILLS, alt 2–4500 ft, TENASSERIM, TAVOY and PENANG, *Wallich* —DISTRIB *Hong Kong*

Stem 6-10 in, sheaths $\frac{1}{4}$–1 in, lanceolate *Leaves* few, 1–2 in, spreading, acute or obtuse *Spike* 3-10 in, slender, lax- or dense fld, lower bracts often $\frac{2}{3}$ in; ovary $\frac{1}{3}$–$\frac{1}{2}$ in, slender, erect not beaked, sepals $\frac{1}{8}$–$\frac{1}{6}$ in, 1 nerved dorsal ovate-oblong, obtuse, petals variable, rather thick, lip very variable in length, and in length of lobes or segments, limb with a short spur over the short broad claw, anther minute, cells nearly parallel, tubes 0, pollinia ovoid grains large, glands obscure, stigmatic processes small, rostellum a plicate membrane stretched across the base of the anther but not? concealing the glands *Capsule* $\frac{2}{3}$ in, sessile, oblong, obtuse —Both this and the following var are found in Penang Lindley errs in giving "Nepal, *Wallich*," as a habitat I suspect that Lindley's *Glossula tentaculata (Bot Reg t 862), of Hong Kong, is only a form of this with elongate* filiform side lobes of the lip

Var *robusta* very stout, 12–18 in, leaves 3–5 by $\frac{3}{4}$–1 in, spike very long many-fld, lateral segments of lip slender exserted much longer than the middle one —Penang, *Wallich, Maingay* (*Kew Distrib* 1662 *Spiranthes*), *Curtis*

99 **H. gracillima,** *Hook f*, stem long filiform, leaves subradical narrowly linear, spike elongate, flowers few minute distant, bracts shorter than the curved ovaries, lateral sepals linear oblong petals broader ovate obtuse fleshy, lip very short fleshy trifid lobes obtuse spur very short inflated 2 lobed Cœloglossum Mannii, *Reichb f in Linnæa* xli. 54

KHASIA HILLS, alt 4–5000 ft on grassy hills, common MUNNIPORE, *Clarke*

Stem 6–16 in, with a few subulate sheaths *Leaves* 1–3 by $\frac{1}{8}$–$\frac{1}{4}$ in alternate, acuminate *Spike* 2–6 in, flowers $\frac{1}{3}$ in apart bracts $\frac{1}{6}$ in ovary $\frac{1}{4}$ in, sepals $\frac{1}{15}$ in, 1-nerved, lip shorter than the sepals, claw as broad as and hardly shorter than the blade, midlobe rather the longest pollinia most minute, broadly pyriform, subsessile on one large flat ovate (2 fid) gland, grains large

Sect VI PHYLLOSTACHYA (See p 132)

100 **H. galeandra,** *Benth Fl Hongk* 263, leaves oblong obtuse or subacute base contracted, bracts ovate, flowers $\frac{1}{2}$ in diam, lip broadly cuneiformly obovate or obcordate, spur a short conical sac Platanthera obcordata, *Lindl in Wall Cat* 7050 *Gen & Sp Orchid* 2?0 P gale-

andra *Reichb f in Linnæa*, xxv 226 P Championi *Lindl in Hook Journ Bot* vii (1855) 38 Gymnadenia obcordata & galeandra, *Reichb f Ot Hamb* 32 33 Orchis obcordata *Don Prodr* 230 O Susannæ, *Herb Heyne*

WESTERN HIMALAYA, Nepal *Wallich* Kumaon, *Blinkworth* alt 7000 ft, *Strachey & Winterbottom* CENTRAL INDIA, Hawalbagh, *Clarke*—DISTRIB China

Tubers small, globose or oblong *Stem* 6–8 in, rather slender, glabrous or puberulous *Leaves* 1–2 in rarely subacute bases not sheathing *Spike* 2–4 in, bracts oblong ovate or lanceolate lower twice as long as the pale purple flowers upper shorter ovaries $\frac{1}{2}$ in long glabrous or puberulous dorsal sepal ovate lateral falcately lanceolate petals rather narrower, obtuse, lip shortly clawed base puberulous, anther cells approximate rostellum very minute —I do not find the difference between the spurs of the Indian and Chinese plant that Lindley indicates

VAR *nilagirica*, leaves broader acute bases sheathing Platanthera affinis, *Wight Ic* t 1693 —Travancore on the Pulney Mts *Heyne, Wight*

VAR *major*, stem 12–18 in leaves and larger flowers more remote —Khasia Hills, at Myrung, alt 5000 ft, *J D H & T T*

101 **H. jantha,** *Benth in Gen Plant* iii 626 leaves imbricate ovate or lanceolate amplexicaul acuminate flowers $\frac{3}{4}$ in diam lip broadly flabelliform or orbicular obovate retuse crenulate spur very short conical obtuse Platanthera jantha, *Wight Ic* v 11 (? t 1692)

102 **H. Helferi,** *Hook f*, stem pubescent leaves and bracts linear or oblong lanceolate acuminate flowers 1–1½ in diam, lip very large orbicular cucullate, spur infundibular acute Gymnadenia Helferi, *Reichb f in Flora* 1872 276, *in Trans Linn Soc* xxx 139

ASSAM (*Herb Wight*) KHASIA MTS *Simons* TENASSERIM, at Moulmein, *Lobb Helfer, Parish*

Stem 12–18 in, rather stout, tubers oblong *Leaves* 4–8 in, sessile acuminate base narrowed *Flowers* shortly pedicelled, sepals falcately lanceolate acuminate, describes the lip as broad or narrow

Sect VII PLECTOGLOSSA (See p 132)

103 **H. Perrottetiana,** *A Rich in Ann Sc Nat Ser* 2 xv 71 t 4 B Platanthera lutea, *Wight Ic* t 919 H lutea, *Benth in Journ Linn Soc* xviii 354, *Gen Plant* iii 626

TRAVANCORE; as the Pulney Mts amongst long grass, *Wight* Nilghiri Hills *Perrottet*

Stem 1–2 ft, very stout; clothed with short imbricating amplexicaul sheathing acuminate leaves 2–3 in long that pass upward into the bracts *Spike* 6–8 in

bracts foliaceous, broadly ovate, 1½–2 in long, cymbiform, acuminate, ovary ¾ in long, erect, slender, beaked, narrowly winged, sepals erect ⅔ in, ovate oblong

as clavate as in most *Habenariæ*, but I have never found them so, though I have examined many flowers The rostellum? forms a broad triangular acute plate extending across the column, and reaching to the bases of the anther cells

Sect VIII DIPHYLAX (See p 133)

104 **H. urceolata,** *Clarke in Journ Linn Soc* xxv 73 t 30 Diphylax urceolata, *Hook f Ic Plant* t 1865

SIKKIM HIMALAYA, Yakla, alt 10000 ft, and NAGA HILLS alt 9000 ft, *Clarke*

Root unknown *Stem* very slender, recurved, with the raceme 4 6 in high *Leaves* one large (2 4 in) subradical elliptic-lanceolate, acute and several small scattered ones alternate higher up all membranous 5–7 nerved *Racemes* 2 3 in, decurved, *flowers secund* ⅙–⅕ in diam very shortly pedicelled *bracts ovate or* lanceolate, as long as the short ovary sepals white and rosy petals 1 nerved, lip recurved, lanceolate, terminal half solid terete acuminate green spur inflated, nearly as long as the sepals, anther beaked, cells contiguous parallel, pollinia oblong, grains large, caudicles very short

Sect IX DIPYLA (See p 133)

105 **H. secundiflora,** *Hook f Ic Plant ined*

SUB ALPINE HIMALAYA Kumaon alt 9 10000 ft, *Duthie* Sikkim, alt 14000 ft, *J D H*, in Chumbi *King s Collector*

Tubers globose small *Stem* 3–5 in, erect or recurved *Leaves* 2 5 in, linear, acuminate, sides complicate bases sheathing *Spike* 1 2 in, more or less recurved, dense-fld flowers secund pink bracts linear lanceolate lower ¼ ¾ in longer than

name

Sect X DITHRIX (See p 133)

106. **H.** (Dithrix) **decipiens,** *Hook f Ic Plant ined*—Herminium, *Griff Notul* iii 270, *Ic Plant Asiat* t 285 f 1

NORTH-WEST INDIA *Edgeworth*, alt 3000 ft Lahul, alt 4–5000 ft, *Thomson*.—DISTRIB Afghanistan, *Griffith*, (*Kew Distrib*, 5326) Kurrum Valley, *Aitchison* No 322

Tubers small, oblong *Stem* 5–8 in, rather slender erect or flexuous, laxly

3 nerved, lip as long as the sepals, obscurely 3-nerved, narrowed from the base upwards, terminal teeth acute, middle one longest —The analysis of the dried flowers has been very difficult, and repeated many times, the capillary stamnodia long escaped detection Resembles a small *Spiranthes* of the *S australis* type, with which it was confounded in Griffith's Herbarium

IMPERFECTLY KNOWN SPECIES

H AFFINIS, *Don Prodr* 25, *Lindl Gen & Sp Orchid* is a small state of *H goodyeroides*

H CARANJENSIS, *Dalz in Hook Journ Bot* ii. (1850) 262, *Dal. & Gibs Bomb F*
bracts
petals
shorter
of Caranjah, *Dal ell*

H GRACILIS, *Coleb in Hook Exot Fl* t. 135, a Silhet plant, figured and described by Colebrooke (*in Hook Exot Fl*), and to which he attributes an articulated fibrous root I know of no plant in this least like the figure Lindley (*Gen & Sp Orchid* 302) suggests its being possibly his *Cœlogloss um breviforum* (H cubitalis, β) It is possibly a bad drawing of *H peristyloides*

H. LOBBII *Reichb f in Linnæa* xli 50, leaf cuneately oblong ligulate acuminate raceme 2 ft lax fld, bracts half as long as the pedicelled ovary long acuminate, dorsal sepal ovate apiculate cucullate 3 nerved lateral triangular retrorse 3 nerved petals linear falcate 1 nerved, lip tripartite, lateral segments linear retrorse, midsegments twice as long linear obtusely acute, spur filiform shorter than the pedicelled ovary tip clavate anther erect emarginate, tubes ascending, staminodes triangular —E. Indies, *T Lobb* Flowers rather larger than those of *H leptoceras Hook Bot Mag*, t 2726 (a Brazilian species)

H LONGIBRACTEATA, *Hook f* stem stout leafy 2-3 ft., leaves 6 by ¾-1 in linear-oblong acute margins thickened bracts 2-3 in narrowly linear lanceolate finely acuminate lip 3 partite segments linear lateral shorter, spur short obtuse Pla anthera longibracteata *Lindl in Wall Cat* 7048, *Gen & Sp Orchid* 293 — BURMA, on the banks of the Irawaddy at Seendva, *Wallich* Wallich's specimens are in very young bud only and the description of the flowers taken from Lindley cannot be depended on It is a noble species and should be sought for in Burma.

H MODESTA, *Dal in Hook Journ Bot* ii (1850) 262, *Dal. & Gibs Bomb Fl* 267, stem leafy at the base, naked above bracts half as long as the ovary, flowers greenish white, lip 3 fid, lateral divisions linear lanceolate free spreading, mid one shorter ovate obtuse cohering with the tips of the petals and upper sepal and concealing the column, spur filiform hardly clavate a little longer than the ovary —The Concan, at Salsette, *Dal ell.* Description from Dalzell, who does not appear to have seen leaves, it is, perhaps, *H stenostachya*

H PELORIOIDES, *Par & Reichb f in Trans Linn Soc* xxx 139, t 27, f A;
..., spike
...anceolate
... Stem
... passing
...ny fld.;
sepals ⅓ in. long, membranous, petals as long as the sepals, lanceolate, 1 nerved; lip very narrow; anther-cells elongate, with very long erect tubes, stigmatic processes long Capsule ⅓ in, sessile, fusiform.—An anomalous plant, clearly a *Peloria* form I have seen but one indifferent specimen

H UNIFLORA, *Don Prodr* 25 Platanthera uniflora, *Lindl Gen. & Sp Orchid* 297 is probably a state of *H triflora*.

107 DIPLOMERIS, *Don*

Terrestrial small 2 fld and 1-2 leaved *Leaves* ensiform or oblong.

longer
broad,
mem-
anther-
cles of
pollinia very long slender, glands small naked, stigmatic processes 0, rostellum prominent between the anther cells

D. , glabrous, leaves ensi *Orchid* 330, *in Journ* *in Wall Cat* 7064, *in* *Fl Ind* iii 452; *Griff* *ant Asiat* t 338, f 2

KHASIA HILLS, alt 4–5000 ft, *Roxburgh*, *Wallich*, &c

Rootstock creeping, subtuberous and fibrous, stem short *Leaves* usually 2, erect, 3–4 by ½–½ in, acute *Scape* about equalling the leaves, naked, 1 fld, bract cymbiform, green, acuminate, flower 1–1½ in diam, white, sepals ovate-lanceolate acute, petals much larger broadly obovate rounded or ovate-oblong, ... rved, thickened beyond ... e habitat, but Wallich's ... ic description is unintel-

2 **D. hirsuta,** *Lindl Gen & Sp Orchid* 331 hirsute, leaf oblong, lip cuneately orbicular Diplochilos hirsutum, *Lindl in Wall Cat* 7065, *in Bot Reg under* t 1499

TROPICAL HIMALAYA Nepal, *Wallich*; Western Bhotan alt 1500 ft *Gamme*

Tubers globose *Leaf* 2–2½ in, radical, with sometimes a small second *Scape* 1–1½ in, flowers 1½ in diam bract oblong, sheathing, sepals 5-nerved, ovate-oblong, subacute, petals very much larger, orbicular, lip with a short slender claw, apex retuse or rounded, apiculate or not, spur 1½ in, very slender, incurved and ascending

108 HEMIPILIA, *Lindl*

Terrestrial 1 leaved tuberous herbs *Leaf* radical, broad *Flowers* laxly racemose *Sepals* equal in length, lateral spreading *Petals* broadly ovate, entire *Lip* continuous with the column broad, obscurely 3 lobed, spreading, spur trumpet shaped *Column* very short, rostellum broad projecting from between the anther cells, complicate, stigmatic processes 0, anther cells subdivergent tips produced into grooves of the rostellum, pollinia 2, caudicles long, glands distant exposed

1 **H. cordifolia,** *Lindl Gen & Sp Orchid* 296, leaf ovate cordate, lip obovate oblong, spur longer than the sepals Platanthera cordifolia, *Lindl in Wall Cat* 7019, *Gen & Sp Orchid* 296

WESTERN TEMPERATE HIMALAYA, alt 4–500–7000 ft, from Nepal, *Wallich*, to ...

with few or ... in diam, ... with low ... her sessile,

2 **H. calophylla,** *Par & Reichb f in Journ Bot* xii (1874) 197,

leaf ovate or oblong, lip obcordate, spur shorter than the sepals, *Reichb f in Ot Hamb* 38, *Bot Mag* t 6920

TENASSERIM, on limestone rocks at Moulmein, *Gilbert, Parish*

Leaf 3-5 in from almost orbicular ovate to linear oblong acute and slender scape and bracts dark green mottled with brown *Scape* with few fld racemes 6 8 in., flowers distant, ¾ in diam, bracts shorter than the ovary, dorsal sepal oblong, and lateral and petals white lip purple side lobes low, rounded midlobe broad, 2-lobed, pollinia small, oblong, adnate to the elongate spathulate caudicles

109 SATYRIUM, *Swartz*

Terrestrial leafy erect herbs, tubers undivided *Leaves* broad or narrow *Flowers* in dense spikes *Sepals* and *petals* subsimilar free, spreading or deflexed *Lip* superior, sessile at the base of the column erect, broad, hooded 2 spurred or sacc[illegible]
broad, concave, or formi[illegible]
dorsal, cells subparallel,
sometimes connate —Spe[illegible]

S. nepalense, *Don Prodr* 26 *Lindl Gen & Sp Orchid* 340, *in Journ Linn Soc* iii 44, *Wight Ic* t 929, *Bot Mag* t 6625, *Wall Cat* 7025 S Perrottetianum *A Rich in Ann Sc Nat Ser* 2 xv 76 t 53, *Wight Ic* t 1716 S albiflorum, *A Rich l c*, *Wight Ic* t 1717 S pallidum, *A Rich l c*

TEMPERATE HIMALAYA, from Kashmir alt 4-6000 ft eastwards, ascending to 11 000 ft in Sikkim KHASIA HILLS, alt 4-6000 ft The DECCAN PENINSULA, from Concan to Travancore CEYLON, alt 4-6000 ft ?BURMA, Shan states, alt 4000 ft, *Manders*

Stem with *spike* 6-30 in, usually very stout, sheathed above *Leaves* few, from oblong to linear oblong 4-10 by 2-4 in rather fleshy sessile, base sheathing *Spike* 1-6 in, dense fld, bracts much larger than the flowers, oblong or lanceolate, [illegible]

Var *Wightiana*, radical leaves few broad, spike short dense fld S Wightianum, *Lindl Gen & Sp Orchid* 340, *in Journ Linn Soc l c*, *Wight Ic* t 1718 —Nilghiri Mts

Var *ciliata* Lindl l l c, a small plant with spurs hardly longer than the sepals —Sikkim, alt 7-12,000 ft, *J D H* Bhotan, alt 10,000 ft, *Griffith*

110 DISPERIS, *Swartz.*

Terrestrial leafy herbs, tubers entire *Leaves* 2 or more, scattered, sessile, cordate *Flowers* solitary or few *Dorsal sepal* very narrow, coherent with the broad petals into a subglobose hood, lateral spreading or deflexed, free or [illegible]
without
if it su[illegible]
below, [illegible]
twisted [illegible]

pollinia, anther oblong obtuse, completely 2 celled grains of pollinia 3-4 seriate, secund on the rachis cuneiform, caudicles rather long twisted glands large naked *Capsule* fusiform—Species 20, Africa and the following

The above description applies to the two Ind an species of th s highly interesting genus, the fertilizat on of wl ich deserves a careful study The analysis of dried specimens is so difficult that I advance the description of the membrane of the column and its appendages (which d ffers from that of others) with hesitation

1 **D. zeylanica,** *Trimen Cat Pl Ceyl* 91 lateral sepals concave not waved petals semilunate obtuse D tripetaloides *Lindl Gen & Sp Orchid* 371 (*in part*), *Thwaites Enum* 311, *Wight Ic* t 930 *&* v 15

CEYLON, in the Central Provinces alt 3-5000 ft, *Walker* &c The MALABAR & CANARA Ghats &c *Wight* &c

Stem 6-10 in erect from the subglobose tubers 1 3 leaved *Leaves* ¾ 1 in d s-

2 **D. neilgherrensis,** *Wight Ic* t 1719, lateral sepals strongly waved, petals lunate cuspidately acuminate

NILGHIRI HILLS *Wight*

Larger and stouter than *D* *zeylanica* with larger redd sh white flowers spotted with crimson the lateral sepals are free or connate and pubescent at the base—Perhaps a form of *D zeylanica*

Tribe V CYPRIPEDIEÆ (See vol. v p 668)

111 CYPRIPEDIUM, *Linn*

Terrestrial herbs with a le[illegible]
or stemless with distichous r[illegible]
leaves and 1-∞ fld scapes *F*[illegible]
ing free on the lateral connate and placed under the lip *Petals* free very [illegible]

temp and trop Asia and America

* Leaves 2, opposite on the stem, plicate

1 **C. elegans,** *Reichb f in Flora,* 1886, 560, villous with cellular hairs, leaves orbicular ovate or oblong, flowers solitary

SIKKIM HIMALAYA, alt 1000 ft, *Pantling* EASTERN TIBET, North of Phari, *King's Collector*

Stem 1-2 ft high below the leaves *Leaves* 1-2 in broad *Scape* shorter than the leaves, bract elliptic, flower about 1 in diam—A very interesting plant, the nearest ally of which is *C japonicum* I have seen only a single small specimen.

* Leaves several, alternate, plaited

2 **C. cordigerum,** *Don Prodr* 37, sepals and narrower petals spreading ovate lanceolate acuminate green or white, lip oblong white, staminode ovate or oblong cordate *Lindl Gen & Sp Orchid* 527, *Dene in Jacquem Voy Bot* 165, t 166

TEMPERATE HIMALAYA, from Kashmir, alt 9 11,000 ft, *Clarke*, to Kumaon, alt 7-9000 ft, *Royle*

Stem 10-24 in, robust or slender, and ovary puberulous. *Leaves* 3-6 by 2-4 in, approximate or scattered, from nearly orbicular to lanceolate acute or acuminate *Flower* solitary, bract 1-4 in, leafy, sepals 1½-2 in, longer than the lip, the con-

[illegible]

[illegible]

iv 87

ALPINE HIMALAYA, from Garwhal to Sikkim, alt 11,500-14 000 ft —DISTRIB Northern and Subarctic Europe and Asia to Japan

Stem 1-1½ ft, usually very stout, pubescent *Leaves* 3-6 by 2-4 in, ovate or oblong, acute, puberulous *Flowers* 1 2 1½-2 in diam, sepals and petals very

[illegible]

striped with dark red

VAR *ventricosa*, *Carrière in Rev Hortic* 1877, 310, dorsal sepal broader, and petals usually much longer, often 2 in long, lip very large 1-1½ in diam C ventricosum, *Swartz in Act Holm* 1800, 251, *Lindl Gen & Sp Orchid* 529, *Sweet* [illegible] nbi, in Tibet, N E of [illegible] an specimen, of which [illegible] by ¾ in, the petals 2

** Leaves radical, distichous, oblong or lorate, coriaceous not plaited Scape 1-3 fld, pubescent or villous

a Petals as broad as the dorsal sepal, short, sessile, broadly oblong, margins not undulate nor warted

4 **C. concolor,** *Batem in Bot Mag* t 5513, leaves oblong or linear-[illegible] and elliptic [illegible] de subrhom [illegible] t 803, *Fl* [illegible] *f in Gard*

TENASSERIM, near Moulmein, *Parish*. UPPER BURMA, in the Shan hills, *Prayer* —DISTRIB Cambodia

Leaves 3– bands
of dark green ıbiform
bract dark pu purple,
petals hardly longer than the sepals, lip small, mouth slightly dilated —Reichb f describes (Gard Chron 1886, 294) a var *chlorophylla* with an interrupted line of purple spots along the midribs of the sepals and petals, and var *sulphurina* (l c 1888, ii 264) with unspotted sulphur coloured flowers Other vars are *tonkinensis*, Lindenia, ii t 77, and *Regneri*, Orchidoph 1885, 226 —The *C Godefroyæ* of Siam is very closely allied, but has dorsal sepals and petals broader than long, copiously spotted, and a 3 toothed staminode

5 **C. niveum,** *Reichb f in Gard Chron* 1869, 1038, *Xen Orchid* ii 155, leaves linear oblong tessellated, scape elongate 1–2 fld, sepals orbicular and broadly oblong petals ciliate, sac of lip ovoid mouth contracted, staminode large transversely oblong *Bot Mag* t 5922, *Ill*

β *Petals as broad as the dorsal sepal or nearly so, spathulate, clawed, margins not v arted*

6 **C. villosum,** *Lindl in Gard Chron* 1854, 125, leaves loriform, not

TENASSERIM, Moulmein, alt 4 5000 ft, *Lobb, Parish*

Leaves 10–18 in, green above, paler beneath *Scape* 1 fld, bract spathaceous
th brown-
base, and
var. with
ea (Gard
with white

7 **C. hirsutissimum,** *Lindl in Bot. Mag* t. 4990, leaves lorate acute not tessellate, bract small and flower hirsute, dorsal sepal erect

rs dark
ed disk;
h green
th dark

γ *Petals narrower but not much longer than the dorsal sepal, sometimes warted on the surface, but not on the margins, which are glabrous*

8 **C. Druri,** *Beddome Ic Plant Ind Or* 23, t 112, leaves ligulate glabrous not tessellated, scape tall 1 fld pubescent, bract much shorter than the ovary, dorsal sepal broadly ovate ciliolate arched, petals linear-oblong obtuse surface warted and hirsute towards the base lip helmet-shaped mouth open, staminode subquadrate *Reichb f in Gard Chron* 1876, 68, *Xen Orchid* ii 223, *Ill Hort* 1877, t 265, *Lindenia*, i t 6, *Flor Mag N S* t 425, *Veitch Man* 22, *with fig*

TRAVANCORE MTS, alt 5–6000 ft, *Drury*

Leaves 7–10 in, bright green *Scape* 9–12 in and small obtuse bracts and ovary pubescent, flowers 3 in diam, dorsal sepal greenish yellow with a broad dark median band and a dorsal keel with black hairs, lower connate sepals smaller, petals incurved tips rounded, bright ochreous yellow, with a dark median band, warts and hairs blackish staminode much smaller than the mouth of the lip, which is bright yellow dotted with purple within, and with acute margins

9 **C. insigne,** *Wall mss in Lindl Coll Bot* t. 32, leaves ligulate

Flore des Serres, 1864

KHASIA HILLS alt 4–5000 ft., *Wallich*, &c

Leaves 8–12 in, acute pale green *Scape* 12 in 1–2 fld and large oblong compressed bracts and ovary pubescent, flowers 4 5 in diam, glossy, dorsal sepal

see *Gard Chron* 1882, ii 716, f 126

10 **C. Spicerianum,** *Reichb f in Gard Chron* 1880, i 40, 74, fig 7, leaves ligulate subacute not tessellated, scape tall 1–2 fld, bracts much shorter than the ovary, dorsal sepal very large erect rhombic obovate hirsute sides strongly recurved below, petals shorter deflexed ligulate

ASSAM (*Low's* and *Sander's Collectors*)

Leaves 6–9 in, dark green, margins more or less waved, beneath purple-spotted near the base *Scape* 9–12 in, slender, pubescent; bract narrow; flowers about 3 in diam; dorsal sepal horizontal, sides at the base so stoutly reflexed as to [illegible] ground, midline purple, petals [illegible] een with a red median band and [illegible] node red, edged with white, base

δ. *Petals narrower than the dorsal sepal, very long in* C Parishii, *margins bearded or hirsute and warted*

11 **C. venustum,** *Wall in Bot. Mag* t 2129, *Cat* 7023, leaves [illegible]

N S t 51

TROPICAL SIKKIM HIMALAYA, alt 3–4000 ft, *J D H*, *Clarke* SILHET and ASSAM, *Wallich*, *Griffith*, &c

Leaves 4–10 in, dark green, marbled with pale green above and dull purple beneath *Scape* 6–9 in, pubescent, flowers 2–2½ in diam, dorsal sepal white with dark stripes, petals spreading, subspathulate, green and purplish, warts blackish, lip yellow green, flushed with pink, and with green reticulations, inflexed lobes yellow nearly closing the mouth —The var. *pardina* has larger flowers, whiter sepals, and larger and more scattered wart on the petals

[illegible] on 1857, 740, leaves linear- [illegible] 1 fld, bracts half as long as [illegible] e erect suborbicular obtuse, [illegible] margins crisped bearded and [illegible] escent, staminode orbicular [illegible] *Bot Mag* t 5024, *Fl des* [illegible] *Orchid Alb* ii t. 70, *Veitch Man* 24, with *fig*

ASSAM, *Tronson* (*Ic in Hort Calcutt*)

Leaves 4–6 in, acute, bright green *Scape* 4 6 in, green, bract green, ovary purple, [illegible] lated [illegible] with p[illegible] deeply [illegible] acute

13. **C superbiens,** *Reichb f in Bonpland* 1855, 227, *in Allgem Gartenzeit*, 1856, 323, *Xen Orchid* ii 9, t 103, leaves elliptic oblong tessellate, scape 1 fld, bract much shorter than the ovary, dorsal sepal orbicular ovate acute, petals broadly linear deflexed fringed with black hairs and warted, lip helmet shaped, staminode suborbicular notched in front, base 2-lobed *Gartenfl* 1863, 49, *Warner Sel Orchid* ii t 12, *Fl des Serres*, t 1996, *Veitch Man* 51, *with fig*, *Gard Chron* 1866, ii 405, f 83, 84 C Veitchianum, *Ill Hort* xii t 429 *De Puydt, Les Orchid frontisp* p. 267, *Rev Hortic* 1871, 595, *fig* 78, 79 C barbatum Veitchii, *Fl. des Serres*, t 1453 C barbatum superbum, *Belg Hortic* 1883, 97.

MALAY PENINSULA, Mt Ophir, *Lobb*

Leaves 5–7 in, pale or dark green with dull blotches *Scape* 9–12 in, 1 fld, flowers ciliolate, 4 in diam, dorsal sepal white striped with green, petals longer than the dorsal sepal, white veined with green, lip brownish purple, inflexed, lobes crimson warted

14 **C. barbatum,** *Lindl in Bot Reg* 1841, *Misc* 53, 1842 t 17, leaves oblong to linear oblong acute tessellate, scape 1–2 fld pubescent, ... ovate or orbicular ... decurved ciliate ... ins, lip helmet ... *Mag* 4234, *Fl* ... orum), *Belgique* ... (var *Warneri*) ... puratum *Wight* ... in *Gart Zeit* ... 887, ii 778 C

PENANG, *Maingay* MALACCA, on Mt Ophir, *Griffith* &c —DISTRIB W Siam

Leaves 4–8 in, pale green above with darker oblong spots *Scape* 10 12 in, ...

Crossu

15 **C. Parishii,** *Reichb f in Flora*, 1869, 322, *in Gard Chron* ... 7 fld ... th the ... margin ... oblong obtusely 2 fid base spurred *Bot Mag* t 5791, *Williams Orchid Alb* ii t 86, *De Puydt Orchid* 188, *Orchidoph* 1887, t 91 *Ill Hort* 1875, t 214, *Gard Chron* 1869, 814 *Veitch Man* 41 Selenipedium Parishii, *Rev Hort* 1885, 132

TENASSERIM, at Moulmein, *Parish*

...

112 APOSTASIA, *Blume*

... nd leafy rigid stems *Leaves* ... terminal or axillary simple or ...

Column short anthers ... at the side narrow, erect, 2 celled, cells parallel,

or 0, stigma terminal long erect, tip discoid —Species 6, Indian, Malayan and Australian

Par i 75, t 84
icled, peduncle
adnate to the

style *Blume in Ann*
Thwaites Enum 315,
Mesodactylus deflexa,

TROPICAL NEPAL, *Wallich* KHASIA HILLS, *J D H & T T* ASSAM, *Griffith*
CEYLON, in the Suffragan

4–10 in, bracts subulate,
capsule ½–¾ in

2 **A. nuda,** *Br in Wall Cat* 4449, *in Wall Pl As Rar* i 76, t 85,
nate 3–5 nerved, spikes
cell-bases equal, stami-
Miquel Fl Ind Bat iii
21 A Brunonis, *Griff*

ASSERIM, at Mergui,
Gr Mt Ophir, *Hullett*
SIN

i shorter than in *A*
Wallichii, as are the ovaries

3 **A. latifolia,** *Rolfe in Journ Linn Soc* xxv 242, leaves petioled elliptic lanceolate finely acuminate very many nerved, spikes panicled, peduncle naked at the base, anther erect bases equal staminode 0

PERAK, *Scortechini, Wray*
Stem 3 ft *Leaves* 4–6 by 1 1½ in nerves very close, petiole 1–1½ in *Panicle* stouter than in *nuda* and *Wallichii*, bracts broader ovaries ¾ in, curved, flowers very small

113 NEUWIEDIA, *Blume*

Terrestrial herbs with a short caudex and leafy stiff stems *Leaves* strongly nerved *Flowers* small in a terminal simple
Sepals and *petals* equal
ader *Lip* subspathulate
discoid, anthers 3, erect,
gma, and one dorsal, cells

1 **N. Lindleyi,** *Rolfe in Journ Linn Soc* xxv 232 t 48 f 10–12, peduncle elongate, raceme elongate many and dense fld and flowers puberulous, bracts 1–1½ in membranous, erect and recurved

PENANG, *Curtis* —DISTRIB Borneo
Stem very short, stout *Leaves* many 1 2 ft by 2–3 in, oblanceolate, membranous many nerved, stoutly petioled *Raceme* 1–2 ft stout erect, rachis stout, bracts much longer than the flowers, narrowly lanceolate, flowers 1 in long, horizontal, pedicelled, ovary ½ in

2 **N. Curtisii,** *Rolfe in Journ Linn Soc* xxv 233, t 48, f 13, 14,

peduncle short, raceme short many fld and flowers pubescent, bracts ½-¾ in erect

PENANG on West Hill alt 2000 ft, *Curtis*—DISTRIB Sumatra

Leaves as in *N Lindleyi*, but peduncle and raceme very short, and bracts glandular pubescent.

3 **N. Griffithii,** *Reichb f Xen Orchid* ii 215 peduncle short, spike short many fld and flowers subhispidly pubescent, bracts ½-¾ in

MALACCA, *Griffith, Maingay* (*Kew Distrib* 1682) PERAK, *King's Collector*

Stem very short *Leaves* 4-10 in elliptic-lanceolate finely acuminate, many nerved, petioled *Raceme* 2-3 in flowers white, very shortly pedicelled, ½ in long, decurved *Capsule* ½ in long, turgid, trigonous

SUPPLEMENT TO ORCHIDEÆ, WITH ADDITIONS AND CORRECTIONS

During the elaboration of the *Orchideæ* for this Flora, very large collections of

species and some genera to the Indian Flora

Vol v p 667 KEY TO THE TRIBES AND SUBTRIBES

The Key to the Indian Genera Subtribes and Tribes was extracted with a few modifications, from that prepared by Bentham for the Genera Plantarum, which whether as regards the difficulties that attend the analysis of the plants of

Sub-order MALAXEÆ I have departed from Bentham, in including LIPARIEÆ and MALAXEÆ under one sub order The essential character of *Liparieæ* the

that 4 is the rule, but one of each pair is often much smaller, and I suspect sometimes suppressed

In line 3 of the character of subtribe *Malaxeæ* for not incumbent, read accumbent or incumbent

P 667 Subtribe ERIEÆ The inflorescence is often subterminal in *Eria*, and appears to be truly terminal in the anomalous genus 10/2 *Claderia* (See p 810)

P 668 The Subtribe CYRTOPODIEÆ of Bentham, is here includ d as far as the

nor saccate lip The only character given for *Cyrtopodieæ*, as distinctive from *Eulophieæ*, is that of the column being produced into a foot but this is invalidated

Subtribe EULOPHIEÆ Terrestrial, never epiphytic Stem rarely pseudo bulbous Lip usually spurred saccate or forming with the lateral sepals a mentum

39 EULOPHIA Lip free from the sides of the column, adnate to its base or foot

48 PLOCOGLOTTIS Lip adnate by a membrane to the sides of the column

Suborder CYMBIDIEÆ Terrestrial or epiphytic Lip neither spurred nor conspicuously saccate, adnate to the base of the column —Genera as at p 671, including *Cremastra*, which has to be added

Suborder VANILLEÆ The free often hippocrepiform pollinia without caudicle or gland, distinguish the Indian species from *Corymbeæ* and *Spirantheæ*

Subtribe CORYMBEÆ differs from all other Indian NEOTTIEÆ in the hard almost woody stem, and rigid leaves, in which respect the species resemble *Apostasia*

Tribe OPHRYDEÆ In 4th line insert long or' before short

Subtribe EUOPHRYDEÆ If I am correct in my analyses of the rostellum in some of the smaller *Habenariæ*, it may prove difficult to separate this subtribe from *Habenarieæ* Under any circumstances the modifications of the rostellum are so great in both, that I doubt its forming a subtribal character

After Subtribe DISEÆ should follow (as at p 675)—

Subtribe CORYCIEÆ, to include 110 DISPERIS This genus and *Satyrium* are the solitary Indian representatives of the extensive S African Subtribes *Diseæ* and *Corycieæ*, which are distinguished from one another by Bentham and more recently by Bolus (the Orchids of the Cape Peninsula) by the former having the sepals and petals all free, and the lip at the base of the column whilst in the latter the dorsal sepal and petals cohere, and the lip is adnate to the column nearly to its tip

Tribe CYPRIPEDIEÆ This tribe I think includes two subtribes if not two tribes, namely—

CYPRIPEDIEÆ Flowers very irregular Lip inflated Anthers 2, one on each side of a large dilated rostellum Staminode very large

APOSTASIEÆ Flowers regular Lip like the sepals and petals Anthers 2 or 3 on the sides of a small erect rostellum, staminode very small or 0

KEY TO THE GENERA

P 669 After 9 BULBOPHYLLUM insert—

0/1 HENOSIS, see Vol v p 771, and for amended characters p 189 of this volume

P 670 After 18 CHRYSOGLOSSUM, insert—

18/2 COLLABIUM *Scape* tall, raceme long *Lip* jointed on to the trumpet shaped foot of the column *Pollinia* 2, 2 cleft, united by a viscus (See Vol v p 784)

After 19 FRIA, insert—

19/1 CLADERIA Terrestrial subscandent Leaves plicate Inflorescence terminal Lip sessile at the base of the long sigmoid column Pollinia 2?

21 PACHYSTOMA, add to description Flowers small, and insert after it—

21/1 IPSEA *Scape* leafless Flowers large Sepals spreading Column elongate, foot 0 Pseudobulb 1 2 leaved

28 For JOSEPHA read JOSEPHIA

29 GLOMERA Cancel this genus (See Vol v p 823)

P 671 EULOPHIA See remarks under Subtribes EULOPHIEÆ, at p 177 of this volume The character of "petals like the dorsal sepal," is subject to many exceptions

41 CYPERORCHIS, though removed in "Gen Plant" from proximity to *Cymbidium*, should stand next to it The two genera are hardly separable After it insert—

41/1 CREMASTRA Sepals and petals and lip very narrow and conniving in a tube Leaf solitary on a tuberous rhizome Scape leafless, sheathed, flowers racemose, secund

Subtribe 3 CYRTOPODIEÆ and 48 *Plocoglottis* For remarks on these see Subtribe *Eulophieæ*, at p 177 of this volume

Subtribe 4 SARCANTHEÆ The classification of the genera of this subtribe presents great difficulties In so far as the Indian genera are concerned I have not been able to improve upon Bentham s arrangement, though I find numerous exceptions to the characters given under the three subdivisions marked by stars

49 LUISIA The *Cristaria* section of *Vanda* unites that genus with this The incurved sepals and petals of Sect *Cristaria* are those of *Luisia*, but the foliage and habit are those of most *Vandæ* The lip of one species of Sect *Cristaria* is spurred or saccate as in *Vanda*, of another it is flat as in *Luisia*, without spur or sac

50 COTTONIA Replace the character by,—Sepals and narrower petals spreading Lip sessile, not jointed at the base of the column, flat Stipes of pollinia long, narrow Raceme very long peduncled,—and follow it with—

50/1 DIPLOPHORA Sepals and broader petals spreading Lip with the sides adnate to the sides of the column, cymbiform, with a compressed bicaudate tip Stipes of pollinia short narrow Raceme very shortly peduncled

P 672 53 PHALÆNOPSIS Add to character of lip, disk with a forked callus or plate, and after foot short, add—or long or 0

54 DORITIS In this genus the foot of the column forms a conical mentum with the lateral sepals

55 RHYNCHOSTYLIS is placed by Bentham in a division of *Sarcantheæ* with a foot to the column and a mentum, but appears to me to have these characters very obscurely if at all The lip and spur are exactly those of *Saccolabium*

56 SARCHOCHILUS is inconstant as regards the presence or absence of a foot to the column, and in having a mentum or spur or neither. It is a truly polymorphous genus, incapable of precise definition

61 SACCOLABIUM The sepals and petals are often incurved To the character should be added—Spur without a callus *under the column* within, or a septum

62 SCHŒNORCHIS As stated at p 54 of this volume this genus was inserted by oversight, *Saccolabium filiforme* having been mistaken for it by Thwaites

63 UNCIFERA and 64 ACAMPE I have been obliged to include under SACCOLABIUM See remarks under the latter genus in this volume, p 54

65 SARCANTHUS and 66 CLEISOSTOMA, are separated from *Saccolabium*, and from one another, by characters so minute and trivial, that they might well rank as sections of that genus, to which 67 *Ornithochilus* might be added

P 673 Subtribe 3 SPIRANTHEÆ The Indian genera of this subtribe are most [illegible] attempt which may aid the student, requires the characters of the minute fleshy column [illegible] accurate analys s in herbarium specimens, however carefully their organs may be moistened or laid out

KEY TO THE INDIAN GENERA OF SPIRANTHEÆ

* Spur or sac of the lip exposed beyond the base of the lateral sepals (See also a few species of *Goodyera*)

79 PHYSURUS Lip not clawed beyond the spur, limb broad abruptly contracted at the base, spur eglandular within; column not appendaged in front, stigma anticous.

80 [illegible] dular [illegible]

81 [illegible] 2 glan [illegible]

82 CYSTORCHIS Lip saccate, contracted into a beak with a small dilated tip, sac 2 glandular within (or not?) column not appendaged in front, stigma anticous

83 HERPYSMA Lip adnate to the sides of the column, limb spreading, spur long naked within, column not appendaged in front, stigma anticous

** Lip if spurred, with the spur or sac covered by the bases of the lateral sepals (except in a few *Goodyeræ*)

† *Lip clawed beyond the spur or sac.*

84 ODONTOCHILUS Lateral sepals connate at the base, claw of lip crenate toothed or fimbriate, limb usually 2-winged, sac 2-glandular within; column appendaged in front, stigmatic lobes lateral

85 HÆMARIA Sepals free, lip adnate to the base and sides of the column, claw winged, limb 2 winged, sac 2-glandular within, column large, clavate, stigma anticous

90 CHEIROSTYLIS Sepals connate to the middle in a tube, lip with a saccate or cymbiform base and 2 lobed toothed or pectinate limb, sac 2 or multi glandular within, columnar appendages long fleshy stigmatic lobes lateral

91 ZEUXINE Sepals free lip with a cymbiform or saccate base, a short broad entire toothed or crenate claw, and broadly dilated limb, sac 2 glandular within, column with two linear appendages in front, stigmatic lobes lateral

†† *Lip saccate or spurred, not clawed beyond the sac or spur*

92 HYLOPHILA Lip a large globose sac with a narrow linear infl xed blade, sac 2-glandular within, column minutely appendaged in front, stigma anticous

93 GOODYERA Lip cymbiform or subsaccate, naked or setose within, column not appendaged in front, stigma anticous

94 HETÆRIA Sepals free at the base or connate, lip adnate to the sides of the column, limb entire or 2 lobed, sac 2 glandular or setose within; column winged or not in front; stigmatic lobes lateral

††† *Lip flat, neither clawed spurred or saccate* (*Subsaccate in* Spiranthes, *and see also some* Goodyeræ)

87 SPIRANTHIS Leaves several

88 NEOTTIA Leafless herbs

89 LISTERA Two leaved herbs

P 674 After 100 GASTRODIA insert—

100/1 YOANIA Sepals and petals free Lip shortly clawed, cymbiform Column 3 lobed A stout leafless herb

P 675 105 HERMINIUM The Herminia will with a saccate base of the lip differ in no way from HABENARIA

P 675 1 O IRIDIFOLIA, Lindl is not the *iridifolia* of Bot Mag t 4517, which is *O tahitensis*

P 676 After 4 O GRIFFITHIANA, insert—

4/1 INSECTIFERA, *Hook f Ic Plant* t 2004, stem 0, leaves 2-4 in ensiform

PERAK, at Larut, *King's Collector*

4/2 O LUNATA, *Lindl Gen & Sp Orchid* 17, stemless, leaves ensiform erect

SINGAPORE, at Selitan, *Ridley* —DISTRIB Java

P 678 12 O FALCONERI After *Hook f* insert—*Ic Plant* t 1780

P 680 After 19 O RECURVA, add—

54 [illegible] O ROSEA, *Hook f Ic Plant* t 2005 stem short, leaves narrowly [illegible] the leaves or shorter, bracts lanceolate, [illegible]ardly longer than the sepals, side lobes [illegible]; Gunong Batu Pateh, *Wray*, Larut, [illegible] by ⅙–¼ in, slightly curved, acuminate [illegible] $\frac{1}{30}$ in diam pink, sepals rounded ovate, [illegible]tals as long, side lobes of lip incurved or spreading *Capsules* stout, [illegible] I do [illegible] [illegible]ribed in " [illegible] [illegible]pproach [illegible]*f Ic Plant* t 2003, stem elongate leaves linear-ens[illegible] The st[illegible] spike very slender, flowers very minute subfascicled, bracts ovat[illegible] above und[illegible]ong erose, lip longer than the sepals quadrately oblong, side lo[illegible] as so short [illegible]ate divaricate, tip bifid with a minute lobule in the sinus, se[illegible]

JYNTEA HILLS, north of Silhet, alt. 3000 ft, *Mann*

Stem 3–4 in *Leaves* alternate, 1 in long, $\frac{1}{4}$ in at the base *Spike* 2 in,

better to transfer *O angustifolia* and place it with *Mannii*, in the broad petalled division with a 3 lobed lip

P 681 23 O PACHYRACHIS, add to habitats—Khasia Hills, alt 4–5000 ft, *Mann*

P 682 29 O CAULESCENS may be easily confounded with 36 *O angustifolia* from which the many straight acuminate leaves narrowed to the base, and pedicelled ovaries, at once distinguish it

P 684 36 O ANGUSTIFOLIA add to collectors' names in the Khasia—*Griffith*, —As mentioned under *O Mannii*, *O angustifolia* had better be referred to the division † δ at p 680, and placed next to that plant

P 686 After 40 insert—

41/1 O CILIOLATA, *Hook f*, caulescent, leaves broadly equitant short broadly ensiform obtuse, spike dense fld, bracts minute lanceolate, sepals ovate acute nerveless and narrow petals ciliate with long hairs, lip quadrately oblong truncate pectinately irregularly toothed

SINGAPORE; at Kranji *Ridley*

Stem $1\frac{1}{2}$–3 in, $\frac{3}{4}$ in broad across the base of the leaves *Leaves* erecto patent, 1–$1\frac{1}{4}$ by $\frac{1}{4}$–$\frac{1}{3}$ in, straight, rather broadest at the base not very coriaceous *Scape* shorter than the leaves, spike 2–3 in flowers hardly whorled $\frac{1}{30}$ in diam shortly pedicelled, sparsely hairy externally, as are the bracts and young fruit *Capsules* pedicelled, $\frac{1}{10}$ in long, turgid, thickly 3-winged

After * Sides of the lip produced upwards into large auricles, add—(CREPIDIUM, *Blume*)

2 M KHASIANA after *Hook f* insert—*Ic Plant* t 1831

P 687 6 M SCOTTII, add—*Ic Plant* t 2001

P 688 8 M POLYODON add—*Ic Plant* t 2002

P 689 Under synonyms of 15 MICROSTYLIS CONGESTA, enter—Neottia plantaginea, *Don Prodr* 26 *fid Lindl Gen & Sp Orchid* 458, and under habitats enter—PENANG, SINGAPORE and MALACCA *Ridley in litt*

P 691 22 MICROSTYLIS CRENULATA, Mr Ridley informs me that the lip is much more rounded than in any other species that it is a much smaller plant than *M Rheedii*, and that it may be a curious form of *M versicolor*

P 692 3 L THWAITESII, add—*Ic Plant* t 2006

P 696 20 L ACUMINATA, add—*Ic Plant* t 2007

21/1, L WRAYII *Hook f*, leaves 3–4 large elliptic acuminate scape shorter than the leaves, bracts minute, sepals subequal linear-oblong 3-nerved, lip deflexed from above the 2 tubercled base cuneately flabelliform beyond the contracted middle truncately 2 lobed, lobes fimbriately toothed

UPPER PERAK, alt 300 ft, *Wray* (*in Herb Calcutt*)

Stem stout, 3–5 in, base swollen, roots stout *Leaves* 4–6 in sessile or contracted into a broad petiole *Scape* rather stout raceme 2–4 in glabrous, pedicels $\frac{1}{4}$–$\frac{1}{3}$ in, flowers $\frac{1}{3}$ in diam, pale green with 2 claret coloured stripes on the lip, sepals flat, at length revolute, petals very narrow margins revolute lip as long as the sepals, column stout, incurved, not winged

P. 697. 24 L DEFLEXA after *Hook f* insert—*Ic Plant* t 2008

26 L PARADOXA Mr Ridley, who finds this species at Singapore informs me that there are two forms, one with pure yellow flowers the other with the sepals and petals deep blackish purple, and the lip green with a purple centre, which is very

P 698 E PARADOXA var *Parishii* Additional specimens of this collected in Upper Burma (Herb Calcutt) appear to prove this to be a distinct species which may be characterized as follows —

26/1 L PARISHII, *Hook f* leaves 2 3 narrowed to the base or broadly petioled lanceolate acuminate, flowers fleshy bracts small ovate acuminate, sepals oblong obtuse 5 nerved l p recurved obovate retuse base with 2 teeth, sides flat, column suberect not winged L paradoxa *var* Parishii, *Hook f l c*

TENASSERIM *Lobb, Parish* UPPER BURMA *Herb Calcutt*

Leaves 2–3 in Scape 6–8 in naked few fld, bracts ⅛ in, pedicels ⅓ in, ribs petals l teeth ra but

P 701 After 37 L OBSCURA insert—

37/1 L LATIFOLIA *Lindl Gen & Sp Orchid* 30 L Scortechini *Hook Fl Brit Ind* v 703 *Ic Plant* t 2009 L robusta *Hook f Ic Plant* t 2012

P 701 After 41 L OBSCURA insert the two following —

KHASIA HILLS alt 3000 ft, *Mann*

Pseudobulbs ¾ in conical-ovoid *Leaf* 4–5 by 1¼–1½ in, thinly coriaceous *Scape* rather stout with few lanceolate bracts sometimes flexuous, bracts ¼–⅓ in lanceolate membranous, spreading pedicel with ovary ⅔ in, sepals ½ in, lip ¼ in broad —A very distinct species perhaps nearest to *L bootanensis* but differing in the 1 nerved sepals and the wings of the column not being hooked

41/2 L TENUIFOLIA *Hook f Ic Plant* t 2013 pseudobulbs small narrow,

rhomboidly orbicular convex puberulous deflexed ep chile, callo, column not winged

UPPER ASSAM on the Mikir Hills alt 1000 ft, *Mann*

P 703 45 L SCORTECHINII see *L latifolia* above

After 46 L FLACCIDA, insert—

46/1 L GRACILIS *Hook f Ic Plant* t 2011; pseudobulbs narrow leaves 2 oblanceolate, scape long slender terete, raceme long lax-fld, bracts as long as the

Pseudobulbs 1 in, sheathed *Leaves* 3-7 in, acute, rather thin, 5-nerved *Scape*

A very distinct species

P 704 After 49 L DISTANS, insert—

flowers ½ in diam, lip broader than long, exactly the shape of an axe or chopper, anterior margin slightly rounded, column incurved, slender, not winged

P 705 53 L RESUPINATA Mr Ridley informs me that the Nilghiri habitat is no doubt an error, taken up from the late N B Ward's Herbarium (at the British Museum) The specimen was collected by Griffith, and no doubt in the Khasia

P 707 LIPARIS DECURSIVA Mr Ridley informs me that this is absolutely identical with *L reflexa* Lindl, an Australian species

P 708 LIPARIS ZEYLANICA Mr Ridley informs me that he cannot guess what Loddiges' *Liparis* from Ceylon is, and that the additional name of *zeylanica* is a misprint in his monograph

In generic character of PLATYCLINIS, after *sepals* and *petals*, add subequal

1 P GRACILIS, in fourth line of character, for linear-oblong read ovate-lanceolate, and after tip rounded, add or acute Add at end, *Ic Plant* t 2016

2 P KINGII, after *Hook f*, insert *Ic Plant* t 2015

P 709 OBERONIA INDICA, at end of character dele (*not of Dene*)

P 710 In character of Sect 1 SARCOPODIUM after "*Leaves* 2" insert in brackets (Leaf solitary in *D longicolle*)

P. 711. Line 6, after *Aporum* add, and *Strongyle*

P 712. 5 DENDROBIUM LONGICOLLE Mr Ridley informs me that this species occurs in New Guinea, and that Reichenbach's *D inauditum* Rchb f (Lindenia ii 66) is a synonym of it, as also that the pseudobulbs are constantly 1-leaved, in which respect it differs from all other Indian *Sarcopodia*, and approaches *Bulbophyllum*

6 D PERAKENSE, after *Hook f* insert, *Ic Plant* t 2019

P. 713 7 D MACROPODUM, add *Ic Plant* t 2020, and for "pedicels very short" read "pedicels with ovary very long"

8 D GEMINATUM, for "*Lindl mss*" read *Lindl Gen & Sp Orchid* 77, and add as synonym Desmotrichum geminatum *Blume Bijdr* 332

10 D PUMILUM "Common at S ngapore, with flowers yellow or cream coloured, l p with a dark spot at the t p or veined with red The two forms look totally different, but I can find no structural difference I never saw so many flowers in a head as in *D quadrangulare*" *Ridley in litt*

P 714 12 D MACRAEI, in line 2, for peduncled read pedicelled

13 D LONCHOPHYLLUM, add *Ic Plant* t 2018

14 D KUNSTLERI, add *Ic Plant* t 2023, and in line 1 for leaves read leaf ' Common in mangrove swamps at Singapore, flower very fugacious, lip superior" *Ridley in litt*

P 723 49 D LEONIS After the hab tats insert, DISTRIB Java "Flowers exquisitely scented of Vanilla" *Ridley in litt*

P 724 51 D GRANDE Add *Ic Plant* t 2024

P 724 52 D ATROPURPUREUM 'I think that the yellow fld *D carnosum* is distinct *D atropurpureum* is smaller sl abbier looking, and the flowers dark claret coloured as in Blume s drawing ' *Ridley in litt*

P 725 After Sect VII STRONGYLE Dele '*Flowers terminal*'

59 D KENTROPHYLLUM Add *Ic Plant* t 2021, and in l ne 2 for flowers terminal, read ' terminal or lateral "

P 726 62 D SUBULATUM, for *Hook f* read *Lindl Gen & Sp Orchid* 91, and add as synonym Onychium sub ilatum, *Blume Bijdr* 328

63 D ACEROSUM Add to Syns, D subteres, *Lindl in Journ Linn Soc* iii 4 "Flowers all white or veined with red, leaves curiously grooved on each side" *Ridley in litt*

P 727 68 D CATHCARTII After *Hook f* insert *Ic Plant* t 2022

P 728 72 D LOBBII add Syn D Teysmanni, *Miquel Fl Ind Bot* iii 640

73 D TUBERIFERUM After *Hook f* insert *Ic Plant* t 2025, and in the habitats, for Singapore read "Perak The Singapore and Chittagong plants are probably different spec es

74 D PODAGRARIA After *Hook f* insert *Ic Plant* t 2026

75 D CLAVIPES, *Ic Plant* t 2027

P 729 After 76 D CRUMENATUM, insert—

76/1 D TENUICAULE, *Hook f*, stem tall very slender above, basal internode minute globose
stout 1 in thicl
few terminating
one branched
cuneate side lc
pubescent

ANDAMAN ISLANDS (*Ic in Hort Bot Calc*)

Stems 10–12 in, sheathed at the upper nodes *Leaves* $\frac{1}{10}$ in broad acute *Bracts* minute pedicel with ovary slender $\frac{1}{4}$ in, flowers $\frac{1}{2}$–$\frac{3}{4}$ in long, pure white,

78 D BOLBOFLORUM To end of specific character add *Ic Plant* t 2028 The spurs at the base of the column, figd and observed by Mr Clarke, are not apparent in dried specimens

P. 730 79 D ADUNCUM. Dele *Bot. Mag* t 6784—Two very closely allied species are confounded under this name D. ADUNCUM and D. HERCOGLOSSUM, agreeing in habit, foliage, inflorescence, and very nearly in flowers, but dis-

both is very shortly clawed Lindley regarded *D aduncum* as closely related to *D. moschatum*, but to me it seems widely different

The following are the characters of the two species —

79 D. ADUNCUM, flowers pale pink, lip with a broad naked area on the pubescent disk —Sikkim and Bhotan Himalaya, Assam

79/1. D HERCOGLOSSUM, *Reichb f* in *Hamb Gartenzeit* xlii 558, in *Gard Chron* 1886, ii 487, flowers bright rose-red, disk of lip villous all over D. aduncum, *Hook f Bot. Mag* t 6784.

SINGAPORE, *Ridley in litt* China

79/2. D. FLAVIDULUM, *Ridley mss*, stems slender pendulous, leaves linear-lanceolate, racemes on the leafless stems short, bracts subacute, dorsal sepal ovate-oblong obtuse, tip thickened, lateral ovate acute deeply keeled from the middle to the tip, petals oblong obtuse 5-nerved, mentum large obtuse shorter than the lateral sepals, lip ovate oblong 3 fid beyond the middle, lobes ciliate, midlobe thickened

SINGAPORE; at Kranji, in Mangrove swamps, common, *Ridley*

Stems 12–18 in, rather flexuous, soft, internodes about 1 in *Leaves* 2½–3 in, acuminate with a notch on one side, membranous *Raceme* with the slender peduncle ½–2 in, bracts ⅙ in, flowers ½ in long, sepals and petals rigid, lip 7-nerved, lobes ovate oblong obtuse.—A very distinct species. Mr Ridley informs me that there are 2 forms of it, one with flowers all yellow, the other with white sepals and petals.

81. D CORNUTUM Insert after *Ic Plant* t 2029

P. 731 82 D CUMULATUM I have examined specimens preserved in spirits sent by Dr King (collected by Mr Lister in Bhotan) The claw of the lip is not short, but may be traced down the spur, and is as long as the blade, and what appeared as a small tubercle in the dried specimen is an elongated grooved callus much raised towards base of the claw, the mentum is more or less laterally compressed, sometimes longer than the sepals The Perak plant doubtfully referred to *D cumulatum* is very different, but not in a state for description

P. 731 81/1 D CROCATUM, *Hook f*, stems terete, leaves 4 by 1 in. lanceolate acuminate, racemes on leafless stems slender few fld, dorsal sepal and petals

King's Annals of the Calcutta Garden

84 D KENTROCHILUM, after *Hook f* insert *Ic Plant* t 2030

85 D MEGACERAS, after *Hook f* insert *Ic Plant* t 2031

P. 732 87 D HYMENANTHUM, after *Hook. f* insert *Ic Plant* t 2032 There being an earlier *D hymenanthum* (Lindl Gen & Sp Orchid 86), I have named this species HYMENOPTERUM in the "Icones Plantarum"

After 89 D PERULA insert—

89/1 D PANDURIFERUM *Hook f* stems elongate cyl ndr c grooved leaves
al broadly ovate
e broadly ovate
nb small deeply
nd an obcordate

in , nodes often
rooting, sheaths membranous, white young green and speckled *Leaves* few, 1 1½ in , acum nate *Racemes* 1 2 in bracts small pedicel with ovary ⅓ in , flowers 1 in long sepals and petals green with streaks of red dots along the

Also near 88 D *ionopus* R f but the flowers are not yellow w th red blotches nor is the claw of the lip th ck and keeled This will be figured in King's Annals of the Calcutta Garden

89/2 D TROPŒOLIFLORUM *Hook f* stem flexuous thickened upwards deeply

⅔ in , green flowers 1 in long sepals and petals ¼–½ in long dark red purple,

P 732 91 D BIFARIUM after *Wall Cat* 2002 add (*in part*), for one of the specimens is a var of *Appendicula bifaria* (See p 83)

P 737 108 D SPHEGIDOGLOSSUM D STUPOSUM being the earl er name should be adopted

P 741 124 D PENDULUM Dele Syn D Wardianum (see No 127) *D melananthum* is cons dered to be a hybrid with *D Wardianum*

P 743 130 D DEVONIANUM, under Syns, after 'not of Lodd,' add, *nor of Roxb , or of Bot Mag*

pectinate lobes on the d sk wl ich are so consp cuous in the latter plant On the other hand, Roxburgh describes the l p as beaut fully marked c l ate and *ramentaceous*,' characters that apply to *Dalhousieanum* and to no other species at all like it

In short, as with *Cœlogyne nitida* & *Geodorum recurvum*, the faulty drawings, all by the same native artist, of the l ps (probabl; in a withered state) have retarded the recognition of otherwise well marked and described species In this view Mr

P 745 137 D BRYMERIANUM Dr Trimen has sent me a fine drawing f om the Peradeniya Herbarium of a cultivated specimen of *D criniferum* showing that has no affinity with *D Brymerianum*, but belongs to the Sect *Cadetia* It is probably a Philippine species

P 746 D MOULMEINENSE, is perhaps only a state of *D dixanthum* At the end of the specific character add *Ic Plant* t 2033

P 748 146 D CHRYSEUM, as stated at vol v p 751, this name must give place to *D aurantiacum*, R f

P 752 D HUGHII Dele, said to be a form of *D crumenatum*, and add to SPECIES UNKNOWN TO ME—

D ANDERSONII, *Scott in Journ Agric Soc Ind* iii (1872) 117, from Burma,

P 753 2 B CLANDESTINUM Common at Singapore, *Ridley in litt*

3 B MACRANTHUM in last line after ' l p add 'strongly recurved," and to citations, *Ridley in Ann Bot* iv (1890), 335, t 22, f 1–6 The flowers smell of cloves, *Ridley*

P 754 After 4 B MEGALANTHUM, add—

4/1 B PATENS *King mss*, scape very short 1-fld, pedicel longer than the lanceolate shortly

Rhizome stout, crinite at the nodes; pseudobulbs 1–1½ in, ell psoid *Leaf* 6–8 in by 2–2½ in, acute, narrowed into a short petiole *Scape* ¼ ½ in, close to the pseudobulb, clothed with short imbricate scales ped cel 1½–2 in, yellowish speckled with red, sepals and petals yellowish, closely mottled with red purple, ¾ 1 in long, lanceolate, lip ⅓ in long, rom the drawing in Herb rkable in the genus, and

P 755 9 B LOBBII, add to habitats Chittagong hills, (*Ic in Herb Calcutt*)

P 756 17 B MEMBRANIFOLIUM After *Ic Plant* insert t 2034

P 757 19 B MEDUSÆ Mr Ridley informs me that there are two forms of this, a Bornean with pale hardly spotted flowers, and a Singaporean with much larger thickly spotted flowers

21 B CONFERTUM After *Ic Plant* insert 2035

P 758 24 B CAULIFLORUM „ „ „ 2036

25 B PROTRACTUM „ „ „ 2037

P 759 29 B MODESTUM „ 2038 B

29/1 B CONCINNUM *Hook f Ic Plant* t 2038 A, scape shorter than the oblong leaf slender few fl, flowers very small, sepals ovate-lanceolate acute 3-nerved cellular, 3 times as long as the lin ar oblong obtuse 1 nerved petals, mentum rounded, lip minute recurved columnar spurs slender

SINGAPORE, at Chang Chu Rang *Ridley*

Rhizome very slender, sheathed, pseudobulbs ⅓–½ in, narrow terete curved.

Leaf ¾-1 in, acute or obtuse, coriaceous *Scape* ¾-1 in, 3 5 fld, sheaths few small, bracts lanceolate nearly as long as the ovary or shorter, flowers orange yellow, sepals about ⅛ in long, dorsal rather the shortest, lip tongue shaped

30 B LEPTANTHUM After *Ic Plant* insert 2039 A, and in line 4 for 3 nerved sepals read 1 nerved petals —Var ? *Gamblei* After a further comparison is

closely allied species are here confounded, both natives of Tenasserim, one is the true *cupreum* var *stenopetalum* which as Mr Rolfe has pointed out to me is also that author s *B rufinum* a plant referred by me by oversight to 58 B CONCHIFERUM (which has no pseudobulb and no auricles to the lip) The following are the characters of the two species —

37 B CUPREUM *Lindl l c*, pseudobulb 1 in subglobose, scape slender inclined slightly curved, sheaths small distant, raceme 1-2 in flowers uniformly coppery yellow, bracts ovate oblong much shorter than the ovary lateral sepals ovate lanceolate acute petals triangular ovate acuminate lip narrow obtuse auricles large, columnar spurs short slender TENASSERIM, *Parish* —Very like *B Careyanum*, but the rhizome and scape are much more slender, the flowers fewer and less dense, and the petals are not aristate Lindley's description is wholly insufficient In his specimen the petals and auricles of the lip are serrulate in others that flowered at Kew they are entire The Manilla habitat is no doubt an error

37/1 B RUFINUM, *Reichb f Xen Orchid* iii 45 t 219, pseudobulb 2 in oblong, scape long stout decurved, sheaths large, raceme 6 10 in lax fld, bracts

flowers readily distinguish this from *cupreum* and *Careyanum*

P 764 32 B GYMNOPUS. After *Ic Plant* insert t 2040
53 B THOMSONI „ „ „ t 2041
54 B SECUNDUM „ „ „ t 2042

P 766 58 B CONCHIFERUM, dele B rufinum, &c See above, No 37/1
61 B APODUM After *Ic Plant* insert t 2043
62 B WRAYI „ „ t 2044

P 767 63 B LEPTOSEPALUM „ „ t 2045
64 B HYMENANTHUM „ „ t 2046, and after it place—

64/1 B ADENOPETALUM, *Lindl in Bot Reg* 1842 *Misc* 85 pseudobulbs obsolete, leaves petioled oblong obtuse base scarcely pseudobulbous, spike rather longer than the leaf many sheathed below many-fld, sepals acuminate, petals spathulate acute glandular within, lip narrowly ovate obtuse ciliate base channelled, *Walp Ann* vi 255

64/2 B VERMICULARE, *Hook f Ic Plant* t 2054, rhizome very slender tortuous, leaves small linear oblong obtuse base narrowed, scape short slender few fld, sepals 1 nerved dorsal linear, lateral ovate lanceolate uncinately falcate, petals narrowly linear 1-nerved, lip linear-oblong obtuse 3 nerved hairy

SINGAPORE, at Kranji, *Ridley*

66 B GLOBULUS After *Ic Plant* insert t 2047

P 768 71 B MICRANTHUM , „ , t 2018

P 769 75 B CIRRHATUM „ „ „ t 2049

P 770 79 B CANDIDUM „ „ „ t 2050

P 770 B ADENOPETALUM See above, No 64/1

P 771 B SILLENIANUM, should be SILLEMIANUM

After B SILLEMIANUM add—

B STRIATELLUM, *Ridley in Ann Bot* iv (1890) 335 (*excl* fig), very small, rhizome filiform, pseudobulbs conic curved leaf lanceolate acute, scape very short

diff rent species for the columnar arms are represented as very slender I do not know where to place this curious 1 flowered species which certainly does not naturally belong to the 1 fld section It may be a depauperated state of a plant of either the racemose or capitate section

9/1 HENOSIS I have erred in the description of this remarkable plant The real petals, which form a minute broad lo v wing on each side of (what is not a column with adnate petals but) the enormous 2-winged column along the naked foot of which they extend as a membranous boarder to the insertion of the lateral

very broad —It may be a question whether this plant should not be restored to

P 773, after 3 C VAGINATUM insert—

3/1 C LONGESCAPUM *Teijsm* & *Binn* in *Batav Natur Tijdscl* xxiv (1862)

Pseudobulb 2 by 1½ in *Leaves* 6 by 1¼ in *Scape* 15 in , flowers 20-25, brown —Description from the authors I know nothing like it The 2 leaved pseudobulbs are remarkable

P 774 9 C ROXBURGHII After *Ic Plant* 2057 A insert—From a drawing lately received from Calcutta, I suspect that *C Andersonii* should be referred to *C Roxburghii*

winged shortly 2 toothed

SINGAPORE, *Ridley*

Pseudobulbs ½ in , close set curved *Leaf* 1-1½ in oblanceolate, obtuse, coriaceous hardly petioled *Scape* from the base of the pseudobulb with membranous sheaths at the base, very slender, shorter than the leaf, flowers 6-8, whorled, bracts minute, pedicels very short, sepals 5 nerved, petals 3-nerved

P 775	15	CIRRHOPETALUM ELATUM, after *Ic Plant* insert—				t 2052
P 777	20	C ANDERSONI,	,,	,,		t 2055
	21	C BREVIPES,	,,	,,		t 2056
	22	C AUREUM,	,	,		t 2057 B
P 778	26	C GAMBLEI,	,,	,,	,	t 2058
	27	C THOMSONI,	,,	,,	,	t 2059
	29	C PARVULUM	,,	,,	,	t 2060 A
P 779	32	C VIRIDIFLORUM,	,	,,	,	t 2061

P 780 33 C BLEPHARISTES In a fine drawing of this lately received from the Calcutta Gardens, the leaves are often 2-nate, the scape long and decurved, and the sepals and petals 7 9 nerved

34 C MACRAEI Under Synonyms, for Bulb Walkerianum, read Macraei

P 782 32 DENDROCHILUM LINEARIFOLIUM, after *Ic Plant* add t 1859 *ined* , and, confer D fuscum, *Teysm & Binn Bat Natur Tydsch* xxix (1867) 212

P 784	2	CHRYSOGLOSSUM ERRATICUM, after *Ic Plant* insert—				t 2062
	3	,, ASSAMICUM,	,	,	,	t 2063
	4	,, MACULATUM, t 2064, and add Syn Tainia maculata, p 821				
		COLLABIUM WRAYI, After *Ic Plant* insert—				t 2065
P 788	11	ERIA EXILIS,	,,	,	,	t 2074 A

P 789 15 E MUSCICOLA The Ceylon form referred to at the end of the description is var *oblonga* Trim *Cat Ceyl Pl* 88

P 790	18.	,, KINGII, After *Ic Plant* insert—				t 2066
	19	,, IRIDIFOLIA,	,,	,,	,,	t 2067
	20	,, LONGIFOLIA,	,,	,,	,	t 2068
P 795	38	, ANDERSONI,	,,	,,	,	t 2069
P 797.	46	,, RECURVATA,	,,	,,	,,	t. 2070
	48	,, SACCIFERA,	,,	,	,	t 2071
P 798	50	,, MAINGAYI,	,,	,,	,,	t 2072
P 801	63	,, ANDAMANICA,	,,	,,	,	t 2073

64 E

cutta drawi

tinguishing

doing so

discolor, it

numerous cochleate coriaceous bracts

E pulchella is a Malayan species, from Tenasserim to Java *E discolor* has been found only in Sikkim Both have nearly orbicular lips articulate with the pulvinate purple shining foot of the column by a very narrow short claw.

P 803 71 E THWAITESII For *Hook f*, read *Trimen Cat Ceyl Pl* 88

P 804 After 72 E PANNEA, insert—

73/1 E CALAMIFOLIA, *Hook f*, stems very short from a creeping rootstock 3–4 leaved, leaves linear terete acuminate, scape terminal 3 4 fld and flowers densely woolly, bracts large ovate acuminate, mentum short obtuse, petals linear-oblong puberulous, lip ovate oblong obtuse very thick concave about the middle, quite smooth and naked

UPPER ASSAM, Makum forest, *Mann*

Rhizome as thick as a crow-quill, and short leaf sheaths sparingly woolly, pseudobulbs 0 *Leaves* 3–6 in, about ⅛ in diam, obscurely channelled above when dry, acuminate, quite smooth, glabrous *Scape* terminal much shorter than the leaves, slender, densely white, silkily woolly as are the backs of the bracts and sepals, bracts ¼ in, sepals ¼ in long, dorsal oblong, lateral triangular-ovate acute; petals much smaller, lip straight, jointed on the broad foot of the column, which is short broad puberulous with an ovate subacute apex and incurved sides; anther mitriform, obtuse —Probably the Sikkim & Khasian *E pannea*

P. 804	75	ERIA PYGMÆA,	After *Ic Plant* insert—	t 2074 B
	76	„ LANCIFOLIA,	„ „ „	t 2075
P. 805	78.	„ CRASSICAULIS,	„ „ „	t 2076
	79	„ LEPTOCARPA,	„ „ „	t 2077
P 806	83	„ GRACILIS,	„ „ „	t 2078
P 807	84	„ OLIGANTHA,	„ „ „	t 2079
	87	„ TUBEROSA,	„ „ „	t 2080
P. 808	89	„ APORINA,	„ „ „	t 2081
P 809	93	„ SCORTECHINII,	„ „ „	t 2082
P 810		CLADERIA VIRIDIFLORA,	„ „ „	t 2083
P 811	4	PHREATIA NANA	„ „	t 2084

P 813 2 SPATHOGLOTTIS AUREA, after *Walp Ann* vi 455, insert *Reichb f* in *Gard Chron* 1888, 92 with fig, *Veitch Man Orchid* Pt vi 6 S Kimballiana, *Hort*

3 S WRAYI, after *Ic Plant* insert t 2086

P 814 4 S BENSONI, „ „ , t 2087

5 S LOBBII, at end of description add in *Veitch Man Orchid* Pt vi 7 this species is described as a native of Borneo Reichenbach gives E Indies, ? Khasia The specimens in Kew Herbarium are from Tenasserim, on rocks at Akyab *Parish*

6 S PUBESCENS var *Berkeleyi* specimen of this in Herb Calcutt from Upper Burma have leaves 1 in broad, the scape 18 in, and flower as in *Fortuni*, except that the midlobe of the lip is very thick, and its wings cuneately oblong and truncate

P 816 1 PHAJUS WALLICHII Add after *Walp Ann* vi 459, *Bot Mag* t.

2 P. VERATRIFOLIUS Add Syn. Dendrobium veratrifolium, *Roxb Hort. Beng.* 63.

P 817 3 P MACULATUS After *Mus Bot* ii 180 insert *Williams Orchid Alb* t 381, and place *Blum Orchid Archip Ind* 9 after *Reichb Fl Exot* t 63

3/1 P NANUS *Hook f Ic Plant* t 2088 *ined*, leaves 4–5 in, scape very short closely sheathed, raceme dense fld, sepals and petals lanceolate acuminate, lip as broad as long puberulous within side lobes rounded, midlobe short broad undulate, spur 0

BENGAL in the Buxa Doar, *Gamble* (in *Herb Calcutt*)

Pseudobulbs 0 *Roots* tufted, rootstock stout with grass like sheaths some- stout *Scape* cts cymb form, very singular the Calcutta ial leaves are singular

25 NEPHELAPHYLLUM, *Blume*

In the generic description in the 2nd line after leaf add, or elongate and exserted, and after 3 N TENUIFLORUM add—

than lobes ircular

tenuiflorum, which has also a tall scape

exaggerated in dimensions

P 820 2 TAINIA PENANGIANA, after *Hook f* insert *Ic Plant* t 2089 *ined*

6 T LATIFOLIA add Syn Cymbid, *Griff Notul* iii 343, *Ic Plant Asiat* t 319

7 T KHASIANA, after *Ic Plant.* insert t 2090
8 T MINOR, „ „ t 2091
9 T HASTATA, „ „ t 2092
10 T MACULATA to be cancelled, it is *Chrysoglossum maculatum*, p 784
11 T LATILINGUA, after *Ic Plant* insert t 2093
14 T MAINGAYI, after „ „ t 2094 and add—

15 T CORDATA, *Hook f*, leaf blade longer than the stout petiole base cordate scape tall many fld slender, sepals linear subacute and lanceolate petals 1-

midlobe, mentum large conical

P 824 3 AGROSTOPHYLLUM GLUMACEUM, after *Ic Plant* insert t 2095
4 A MAJUS „ „ „ t 2096
5 A LAUCIFLORUM „ „ „ t 2097
P 825 2 CERASTOSTYLIS MALACCENSIS „ t 2098
3 C CLATHRATA „ t 2099
P 826 4 C PENDULA „ „ „ t 2100
5 C HIMALAICA „ „ „ t 2101
6 C LANCIFOLIA „ „ „ t 2102
P 827 7 C ROBUSTA „ „ „ t 2103
33 TRICHOSMA SUAVIS, for 1841 *Misc* 83, read 1842 t 21

P 828 34 CŒLOGYNE After the publication of Vol V of this work Veitch's Manual Pt vi appeared containing the cultivated species of *Cœlogyne* with good descriptions, and with figures of several British Indian ones which are cited below

1 CŒLOGYNE GARDNERIANA after *Paxt Mag* vi t 73 insert *Williams Orchid Alb* iv t 153

P 829 4 C CRISTATA, after *Coll Bot* t 32 insert *Gen & Sp Orchid* 39 (*excl Syn* Cymbid strictum *Don*) and add to citations *Wall Cat* 1958, *Gard Chron* 1877 597 *with fig*, 1888, i 488, *fig* 68, *Veitch Man Orchid* Pt vi 34 *with fig*

P 830 6 C TOMENTOSA add *Veitch Man Orchid* Pt vi 57 *with fig*
7 C MASSANGEANA, add „ „ „ 43 *with fig*

P 831 After 9 C LENTIGINOSA insert—

9/1 C ROSSIANA, *Reichb f in Gard Chron* 1884 ii 808 pseudobulbs large 8-10 grooved leaves elliptic lanceolate petioled scape very stout decurved then suddenly upcurved 3-4 fld closely clothed with short densely imbricate sheaths, ... etals white lip narrow ovate entire revolute a slender med an one ... *t Mag* t 7172

... 8-12 by
2 3 ... udobulb
2-3 ... sheaths
cori- ... , bracts

¾ in long, as long as the pedicel and ovary, lanceolate, concave, caducous, flowers 1¼ 2 in diam, sepals ½ in broad, midlobe of lip not contracted at the base, column white —The strong decurvature of the scape is not mentioned by Reichenbach or Veitch

P 831 11 C CORYMBOSA, after *Gard Chron* 1876 insert, 88

P 832 16 C OCCULTATA, insert after *Ic Plant* 2104

P 834 After 21 C CYNOCHES insert—

by 1-1¼ in *Scape* lateral, 6 in clothed with cylindric green tubular truncate sheaths 1½-2 in long, and with 2 leaves emerging from the upper sheath, bracts very narrow, at length deflexed, flowers nearly 2 in diam midlobe of lip yellowish towards the centre, margins at the base crisped In many respects allied to *C Mainayi*

24 C SCHILLERIANA, insert after the description, TENASSERIM, at Moulmein, *Lobb*

P 835 28 C PANDURATA, in line 1 for 78 read 791, and add to citations, *Veitch Man Orchid* Pt vi 47, *with fig*

29 C ASPERATA Veitch (*Man Orchid* Pt vi 31) says of this, "Widely distributed over the Malay Archipelago, from Sumatra to New Guinea"

P 836 33 C MICRANTHUM should be MICRANTHA

P 837 34 C TREUTLERI after *Ic Plant* insert t 2105

36 C NITIDA under Syn C OCELLATA add *Veitch Man Orchid* Pt vi 45

37 C STENOCHILA, after *Ic Plant* insert t 2106

P 838 38 C CARNEA, after *Ic Plant* insert t 2107

39 C ELATA This is said to inhabit higher regions than the Tropical, up to 9000 ft (*Veitch Man Orchid* Pt vi 37)

41 C GRIFFITHII After *Ic Plant* insert t 2108.

P 839 42 C. BARBATA, add *Veitch Man Orchid* Pt vi 32, *with fig*

P 840 47 C. ANCEPS After *Ic. Plant* insert t. 2109

48 C PRÆCOX In line 1, before *Fol Orchid* insert *Gen & Sp Orchid* 43, and

description of this

P 841 50 C MACULATA, add VAR Arthuriana *Veitch Man Orchid* Pt. vi 57, pseudobulbs smaller angular, flowers smaller, petals with purple lines, midlobe of lip margined with a purple band C Arthuriana, *Reichb f in Gard Chron* 1881, i 40 —*Rangoon*

51 C LAGENARIA, Veitch (*Man Orchid* Pt. vi 57) gives a good figure of the flowers, and adds that it was introduced by Lobb from the Khasia Hills

52 C REICHENBACHIANA, Veitch gives 6-7000 ft. as the elevation at which this species was found

P 842 53 C HOOKERIANA Veitch (*Man Orchid*. Pt vi 53) cites a var *brachyglossa*, *Reichb f in Gard Chron* 1887, i 833, with a shorter and more open

lip, white with a light yellow disk spotted with brown, and pale rose sepals and petals. It is a native of Sikkim at a higher elevation than the type C HOOKERIANA is, as stated at p. 828 the only species in which the leaves persist after flowering

55 C. ? PURPURASCENS, after *Ic Plant* insert 2109

P. 843 C. ROSSIANA See ante p 192

1 O ALBA After *Wall mss* add Dipodium, *Griff Ic Pl Asiat* t. 329 (*not of Notul.* iii. 406)

P. 847. 11 PHOLIDOTA, for MICRANTHA, read PARVIFLORA

1 CALANTHE TRICARINATA. Add to citations *Veitch Man Orchid* Pt vi 69; *Franch & Savat Enum Pl Jap* ii 26, and after habitat add, DISTRIB Japan —I have not compared the Japanese with the Indian plant

P 849 5 C DIPLOXIPHION After *Ic Plant* insert t 2111

P. 850 10 C MANNII, after *Hook f* insert *Ic Plant* t 2113
11 C WRAYI " " " t 2114

P 851 15 C VERATRIFOLIA To the synonyms of this species add Veitch *Man Orchid* Pt vi 88 and C Petri, *Reichb f in Gard Chron* 1880, 326 C colorans, *Pf l c* 1885, 360, *Williams Orchid Alb* v t 218 C australis, *Hort* It is well figured at p 69

P. 852 16 C VESTITA Under *Bot Zeit* for xvi 128 read 1853, 193 Veitch (*Man Orchid Pt* vi 70) enumerates several subvars, as gigantea, *Williams Orchid Alb.* v t 211, (Syns grandiflora *Hort Belg* 1889, 121 and rubro oculata, *Paxt Mag* xvi 123, *Regel Gartenfl* 1873, 751), also Var Regnieri, C *Regnieri*, *Reichb f in Gard Chron* 1883, 274 with its Subvars Sanderii and [illegible] rneri, with the elongated

[illegible] pseudobulbs 6 by 1½ in [illegible] ne 14-fld flowers pink [illegible] nary 2 in, sepals sub similar dorsal ¾ in slender lanceolate mucronate, lateral longer mucronate, petals shorter more spathulate, lip rose-pink darker at the base adnate to the base of the column erect 4 lobed, side lobes oblong erect appressed to the column, midlobe deeply divided segments rounded with an interposed tooth, spur ½ in filiform curved, column as in *C vestita*

Langkawi Island, north of Penang, *Curtis* —I have seen no specimen

P 854 27 C ANGUSTIFOLIA To Syn *C phajoides* add *Ic Plant* t 1864

P 855 After 31 C GRACILIS, add—

31/1 C LONGIPES, *Hook f*, stems tall, scape axillary very long stout, raceme very short and flowers pubescent, lateral lobes of lip rounded crenate, midlobe [illegible] lamella on each

[illegible] 12 in with 2 3 [illegible] rved and 3-nerved petals subequal elliptic, acuminate, lip as long as the sepals adnate to the base of the column —I have seen but one flowering specimen of this plant which is l afless, its habit is that of *C tubifera*, but the flowers are very much smaller, the sepals broader

P. 856 33 C. LABROSA, for *Hook f* substitute *Reichb f in Gard Chron* 1883, 44

P 858 7 ARUNDINA CANTLEYI, after *Ic Plant* insert t 2112

VOL VI

P 1. Under 1 E VIRENS, for 1 rubrum read Frotrion

P. 5 11 P DECIPIENS in line 1, for *Griff* read *Kar*

P 3 8 E EXILANATA, at end of diagnosis insert *Hook I Pl t* t 1882

P 6 After E SQUALIDA, insert—
29/1 E HOLOCHILA, *Coll & Hemsl in Journ Linn Soc* XXVIII 132, raceme

Leaves very young at flowering time *Scape* 12 in as thick as a swan's quill, with two oblong ventricose obtuse sheaths below the middle, raceme 6 in, bracts slender, membranous, pedicel with ovary ¾ in, flowers 1½ 2 in broad, sepals 7 nerved, lateral adnate to the sides of the spur, petals 5 nerved the outer pair branching outwards lip about as long as the sepals, nerves very many parallel, mentum spur like —Only one specimen seen by me

P 8 25 E SANGUINEA Add Syn C rufa, *Thw Enum* 302, and to the habitats, CEYLON, at Hantani, alt 3000 ft *Thwaites*

CYRTOPERA RUFA, *Thwaites* This plant was unknown to me till I was shown a

P 32 After 2 DORITIS WIGHTII insert—

3 D BRACEANA *Hook f*, scape stout elongate, mentum spur like acute, side lobes of lip ovate lanceolate midlobe spathulately obovate

SIKKIM HIMALAYA *Gamble*

Roots very many broad flat *Stem* very short *Leaves* oblong, very dark green *Scape* much longer than the leaves, as thick as a crow quill or thicker, very dark green, speckled with brown, raceme 6-10 fl, bracts minute, triangular, peduncle with ovary ¾-1 in, decurved, flowers 1 in diam, sepals obovate oblong, obtuse and narrower petals fleshy yellow with pinkish midrib, lip membranous

like mentum

P 40 After 26 SARCOCHILUS MERGUENSIS, insert—

rounded back and very deep channel in front *Peduncle* glabrous, bracts ovate-

viridiflorum Thw

P 44. To habitats of 3. E CYLINDRACEUM, add CEYLON

P. 55 For 1 S GEMINATUM read GEMMATUM

P 60 Under the citations for 20, S CALCEOLARE, in line 2, for Bot Reg 1883, Misc 130, read 1838, Misc 75

P 62 To syns of 29 S LONGIFOLIUM add Ærides rigidum, *Smith in Rees Cyclop.*

30 S WIGHTIANUM, under the syns place *Thwaites Enum* 303 after *Lindl Fol Orchid* 2

P 88 3 G JAVANICA add to habitats, CEYLON, on roots of coffee trees in the Central Province, *Thwaites*

P 107. 1 Z SULCATA, add to syns Orchis strateumatica, *Linn Sp Pl* 903

P. 116 5 H ELONGATA, add to syns Rhamphidia elongata, *Thwaites Enum* 313, and to habitats, CEYLON, alt 4000 ft, *Thwaites*

P. 141 [illegible]
been mixed up [illegible]

30 H LO[illegible]
few (2-3) very large flowers, large cucullate sheathing bracts much shorter than the long pedicelled ovary, lip twice as long as the sepals

30/1 H DECIPIENS, *Wight Ic vol v pt i p* 14, with several (4 8) smaller flowers, very short pedicels, lanceolate bracts nearly as long as the ovary, lip rather longer than the sepals H montana, *Wight (not of A Rich) Ic* t 827, and 1714 the upper right and the left hand figures only —This much resembles H *longicornu* Lindl (*montana*, A Rich) but has a longer lip and much longer spur Wight has given it both names in his Herbarium, and says there that it is intermediate between *longicornu* and *longecalcarata*

P 147 48 H CHLORINA, insert *Par* § before *Reichb f*

P 151 63 H CRASSIFOLIA, add to syns P canarensis, *Lindl Plant Hohenack. Exsicc* n 142

P 165 106 H DECIPIENS This name being confirmed for Wight's plant (see above) must be replaced by H GRIFFITHII

INDIAN ORCHIDEÆ OF UNDETERMINED AFFINITY

In the above revision of the Indian Orchids I have doubtless overlooked some species that have been published in one or other of the multitude of works I have

„	calceolaria „	,	45	
„	Calceolaria terrestre		63	Malacca
„	clavatum ,	,	50	? Saccolabium clavatum, Lindl Gen & Sp 223
„	complanatum „	„	50 =	Sarcochilus complanatus Hook f ante p 41
„	Flabellum Veneris „	,	57	
„	Flos aeris v Saaronicum		58	Renanthera Arachnites, ex *Lindl Gen & Sp* 217
„	Flos aeris ? „	,	64	

Epidendrum hexandrum, Kœn in Re z. Obs Pt vi 45 = Appendicula Kœnigii, *H f* ante p 84
„ liliflorum „ „ „ 61 = Limodorum liliflorum, *Willd*
„ longiflorum , „ „ 53
„ lycopodioides „ „ „ 55 Malacca, on Mangostin bark.
„ nudum „ „ „ 52
, ophrydis , „ , 46
„ orchideum „ „ „ 48 = ? Ceratochilus orchideus, *ex Lindl. Gen & Sp Orchid* 232
, plantaginifolium „ „ 60 Malacca, near Tsing, on top branches of loftiest trees
„ pusillum , „ „ 49 = Sarcochilus Wightii, *H. f*, ante p 37
„ sessile „ „ 69 = Bulbophyllum clandestinum *L ante* v p 753
„ spathulatum , „ „ 43 = Vanda spathulata, Spr. ante p 50
„ subulatum , „ „ 51 = ? Erides cylindricum, L, *ex Lindl Gen & Sp* 240
„ Supplex minima „ „ 47 = Dendrobium atropurpureum, Miq ante v p 724
„ tomentosum „ „ „ 53 = Eria tomentosa, Lindl ante v p 803
„ variegatum „ „ „ 44
Serapias Epidendræa „ „ „ 65 = Eulophia virens, Bl ante p 1

Order CXLIX. SCITAMINEÆ. (By J G Baker, F R S)

Herbs, often large, rarely with a woody caudex *Leaves* cauline or radical, usually membranous, closely pinnately nerved from a midrib *Flowers* bracteate and often bracteolate, solitary or spicate, rarely panicu-

... ly crowned with the remains ... or membranous and inde... ... mbryo small —Genera about 40, species 4–500, chiefly tropical

The Traveller's tree, *Ravenala madagascariensis*, Sonnerat (Urania speciosa, *Wall Cat* 5765), is frequently planted, especially near Singapore It has much the leaves of a *Musa* but they are distichous

Tribe I **Zingibereæ.** *Calyx* tubular or spathaceous *Stamen* 1, anther 2 celled, lateral staminodes filiform or petaloid, or small, or 0 *Style* slender, embraced below the stigma by the anther *Embryo* central, straight.

* Ovary 1 celled, placentas 3, parietal

1 MANTISIA Scape leafless corolla tube long, lateral staminodes filiform or spathulate, in the middle of the elongate filament opposite, spreading

2 GLOBBA Stem leafy, corolla tube long, lateral staminodes petal like, filament slender

3 HEMIORCHIS Corolla tube short, lateral staminodes petal like, filament short

** Ovary 3 celled, placentas axile

† Lateral staminodes broad

§ *Connective spurred at the base*

4 ROSCOEA Flowering stem leafy bracts 1 fld filament long, capsule subdehiscent —Flowers purple or white

5 CAUTLEYA Flowering stem leafy bracts 1 fld filament long, capsule dehiscent with recurved valves —Flowers yellow

6 CURCUMA Flowering stem leafy or not bracts cucullate several fld, forming a cone like spike, filament petaloid, capsule subdehiscent

§§ *Connective very broad or crested, not spurred*

7 GASTROCHILUS Flowering stem short or erect filament short connective broad not crested

8 KÆMPFERIA Flowering stem leafy or not, filament very short, connective crested

9 HITCHENIA Flowering stem leafy filament long complicate, connective broad not crested Inflor as in *Curcuma*

§§§ *Connective very narrow neither spurred nor crested*

10 HEDYCHIUM Flowering stem leafy filament long slender

†† Lateral staminodes small or 0 rarely narrow and adnate to the lip

§ *Flowers in a dense fl cone like spike*

11 AMOMUM Flowering scapes usually leafless filament short, anther cells diverging above connective dilated crested or 2 lobed rarely simple

12 ZINGIBER Spikes terminating leafy stems or leafless scapes filament short anther cells parallel connective usually produced into a long appendage

13 COSTUS Spikes terminating leafy stems or leafless scapes filament petaloid anther adnate to its middle cells parallel

§§ *Flowers in lax fl spikes or panicles*

14 CYPHOSTIGMA Scape leafless panicle loosely flowering from the base upwards filament short connective with a 3 lobed crest

15 ELETTARIA Scape leafless panicle loosely flowering from the base upwards, filament very short anther cells parallel connective not dilated

16 ELETTARIOPSIS Scape leafless, spike simple bracts small, filament short anther petaloid

17 SCAPHOCHLAMYS Scape leafless spike simple bracts large, persistent, filament short connective petaloid

18 ALPINIA Spike or panicle terminating a tall leafy stem, filament long, connective shorter than the anther or longer and dilated.

19 RHYNCANTHUS Spike terminating a leafy stem, filament long, connective not dilated

Tribe II **Maranteæ.** *Calyx* of free sepals, rarely loosely cohering *Stamen* 1, anther 1 celled laterally adnate to a lobe of the perianth,

20 CLINOGYNE Stem leafy with terminal panicled scattered flowers, panicle with convolute deciduous sheaths at the forks, bracts deciduous

21 PHRYNIUM Stem with one broad leaf, and a lateral head or spike of flowers, or spike radical, bracts and bracteoles persistent

Tribe III **Canneæ.** *Sepals* free *Stamen* 1 anther 1 celled, adnate to lateral petaloid filament staminodes 4 *Ovary* 3 celled, cells many ovuled, style flattened, stigma terminal *Embryo* straight.

22 CANNA

Tribe IV **Museæ.** *Sepals* free or connate in a split spathe *Stamens* 5, free, anthers linear, 2 celled, staminode 1 or 0 *Style* central, stigma 2-3 fid *Embryo* short

23 MUSA Stem subarboreous, stout, simple, flowers in a stout terminal spike, calyx tube short

24 LOWIA Stem slender, dichotomously branched, flowers clustered at the base of a petiole, calyx tube very long

1 MANTISIA, *Sims*

Rhizome short, creeping, leafy stem short *Scape* short, sheathed below *Leaves* oblong lanceolate, caudate *Panicle* laxly fid, bracts at the fork
lobed
Lateral
ment, sl
cells lin
style filiform, placed in a groove of the filament, stigma turbinate *Capsule* globose, dehiscing at the apex *Seeds* many, minute, oblong — Species the following

1 **M. saltatoria,** *Sims in Bot Mag* t 1320, staminodes linear-subulate *Horan Prodr* 19 Globba saltatoria, *Rosc Scitam* t 112 G purpurea *Andr Bot Rep* t 615 G radicalis, *Roxb in Asiat Res* xi 359, *Corom Pl* t 230 G subulata, *Roxb Hort Beng* 2, *Fl Ind* i 81

2 **M. spathulata,** *Schult. Mant* i. 49; staminodes with a narrow claw and flattened petaloid blade *Horan. Prodr* 19 Globba spathulata. *Roxb Hort Beng* 2, *Fl Ind.* i 83

SILHET, *Roxburgh*, CHITTAGONG, *Lister*

Habit and foliage of *M saltatoria*, but panicle larger, branches more numerous, bracts oblong, uppermost about as long as the calyx, corolla-segments narrower, lip less deeply bifid, staminodes much shorter, and placed lower down on the filament.

2 GLOBBA, *Linn*

Rhizome short, creeping, stem erect *Leaves* oblong or oblong-lanceolate *Flowers* in terminal panicles, rarely spikes, bracts usually deciduous, buds often replaced by bulbils *Calyx* funnel-shaped, 3-lobed *Corolla* tube ... *minodes* petaloid, ... it with 2 dorsal ... mple, winged or ... ntas 3, parietal, ... urbinate *Cap-* ... d small, white,

SECT. I **Aplanthera,** *Horan* Anther neither winged nor spurred

* *Leaves glabrous beneath (or slightly pubescent in* G racemosa)

1 **G. racemosa,** *Smith Exot Bot* ii 115 t 117, leaves slightly hairy ... narrow, lower branches 2-3-fid at ... s, corolla segments and staminodes ... bifid, capsule smooth G orixensis,

CENTRAL and EASTERN HIMALAYA, ascending to 6000–7000 feet in Kumaon.

Leafy stems 1½–2 ft *Leaves* 6–9 in, oblong or oblong-lanceolate, subcaudate, sometimes slightly hairy beneath on the ribs towards the base *Panicle* ½–1 ft, rachis glabrous, branch-bracts and flower-bracts caducous *Calyx* ¼ in, yellowish, shortly lobed *Corolla* bright yellow, tube 2 3 times the length of the calyx, segments ⅙ in, reflexed, filament 2–3 times the length of the segments *Capsule* ⅓ in. —The name *racemosa* is a misleading one

2 **G. orixensis,** *Roxb in Asiat. Res* xi 358, *Hort Beng* 2, *Corom Pl* t 229, *Fl Ind* i 78, leaves glabrous beneath panicle long narrow, lower branches 2-3 fid at the tip, bulbils 0, bracts small deciduous, corolla-segments staminodes and lip equal in length, capsule warted *Horan Prodr* 19

SIKKIM HIMALAYA, at a low level, *Hook f et Thoms* (*Herb Ind Or* No 15) NORTHERN CIRCARS, *Roxburgh*

Nearly allied to *G racemosa*, but flowers smaller, deep orange, with a shorter corolla-tube, lip spotted with red-brown at the throat, capsules smaller

3 **G. Clarkei,** *Baker*, leaves glabrous beneath, panicle long narrow, lower branches 2-3-fid at the tip, bulbils many bracts small deciduous, corolla-segments and staminodes ovate equal in length, lip longer shortly 2 lobed, capsule smooth

SIKKIM HIMALAYA, alt 3000–7500 ft (*Herb Ind Or, H f & T*, No 9), KHASIA HILLS, *J D H* alt 3000–5700 ft, MUNNIPORE, *Watt*

Nearly allied to *G racemosa* but racemes longer and laxer, with most of the upper flowers changed into bulbils, calyx less coralline, usually brownish, corolla yellow, tinged with brown

4 **G. Wallichii,** *Baker*, leaves small glabrous beneath, panicle very long lax-fld, branches 1-2 fld, bracts small deciduous, bulbils few or 0, corolla-segments ovate, staminodes lanceolate rather longer, lip small placed a little above the segments, capsule small smooth G. pendula, *Wall Cat* 6533, *not of Roxb*

PENANG, *Wallich*, *Curtis*

** *Leaves more or less pubescent beneath.*

5 **G. Hookeri,** *Clarke mss*, leaves very hairy on the midrib beneath, panicle long narrow, lower branches 2-3-fld at the tip, bulbils sometimes present, bracts small deciduous, corolla-segments and staminodes ovate and equal in length, lip longer shortly bifid, capsule smooth

NEPAL, *Wallich*, SIKKIM HIMALAYA, alt 3000-5000 ft, *J D H* (*Herb. Ind. Or.* No 10) NAGA HILLS, alt 4500 ft, *Clarke*

Doubtfully distinct from *G racemosa*, but more robust and floriferous, with broader leaves *Flowers bright yellow*, *lip not spotted*

6 **G. ophioglossa,** *Wight Ic* t. 2002, leaves finely pubescent beneath, panicle narrow, lower branches 4-6-fld, bracts small deciduous, lower nodes with a few bulbils corolla segments ovate, staminodes longer lanceolate, lip longer deeply bifid, capsule smooth *Horan Prodr* 19 G. orixensis, *Wall Cat* 6535 A, C, D, I, *not of Roxb* Alpinia? Missionis, *Wall Cat* 6580

TRAVANCORE *Heyne*, Anamallay hills, &c, *Wight*, *Jerdon*. COCHIN, *Gamble*. BEHAR, on Parasnath, alt. 2500 ft, *Vicary*, *Clarke*.

Leaf conspicuously caudate, 6-9 in *Panicle* 4 6 in, rachis and branchlets glabrous, flowers not crowded at their tips, bulbils ovoid, deflexed *Calyx* ⅙ in, broadly funnel-shaped, pale green, teeth broad, ovate *Corolla* pale yellow, tube 3 times the length of the calyx, segments ⅛ in, ovate, lip twice the length of the segments, lobes longer and narrower than in others of the section *Capsule* ⅓ in., globose

7. **G. multiflora,** *Wall Cat.* 6537 A, leaves pubescent beneath, panicle long narrow, lower branches 4-6-fld, bracts small deciduous, lower nodes with bulbils, segments of corolla and staminodes ovate and equal in length, lip not longer shortly bifid, capsule smooth G velutina, *Wall. in Voigt Hort Sub Calc.* 573 (*name only*)

[illegible]

segments and lip ⅛ in, filament ¼ in, anther ⅛ in, sometimes obscurely margined.

8 **G. substrigosa,** *King mss*, leaves very pubescent on both surfaces, panicle lax cernuous, branches few-fld, bulbils 0, bracts large foliaceous persistent, corolla-segments ovate, capsule pubescent.

TENASSERIM, *Gallatly*.

Whole plant not more than 6-8 in. *Leaves* few, oblong-caudate, the largest 3-4 in *Panicle* 1½-2 in, branches few, short, lower spreading or reflexed; bracts oblanceolate-oblong, pubescent *Calyx*-tube ¼ in *Corolla* yellow, gland-dotted. *Capsule* blackish, the size of a pea.

9. **G. Andersoni,** *Clarke, mss.*, leaves slightly pubescent beneath,

panicle lax, flowers crowded at the tips of the branches surrounded by a whorl of large bracts, corolla segments and staminodes equal in length, lip longer deeply bifid, capsule warted

SIKKIM HIMALAYA, alt 1500-2000 ft (*Hk fil & Thoms Herb Ind Or* 12), *Clarke Gamble, King*

Habit and leaves of *G racemosa* *Leaves* sometimes 1 ft, caudate *Panicle* 3-4 in, erect or spreading rachis very hairy, branchlets short, spreading, bracts ½ in, dark, ovate, membranous *Calyx* green, tubular *Corolla* bright yellow, tube 2-3 times the length of the calyx, segments ⅛ in, filament nearly 1 in

10 **G. arracanensis,** *Kurz in Journ Asiat Soc Beng*, **xxxix.** pt ii 83, leaves slightly pubescent beneath, panicle short, flowers crowded at the tips of the short branches surrounded by a whorl of large bracts, corolla segments ovate lilac lip deeply bifid, capsule smooth.

ARRACAN, forests of the low sandstone hills, *Kurz*

[illegible] *Panicle* 3-4 in, subsessile, rather [illegible] vite, obtuse, membranous, lilac [illegible] or tinged with lilac, segments [illegible]

SECT II **Careyella,** *Horan* Anther with a narrow entire border

11 **G. sessiliflora,** *Sims in Bot Mag* t. 1428, raceme narrow or subspicate, bulbils many on lower nodes, corolla-segments ovate, staminodes longer lanceolate, lip long deeply bifid *Horan Prodr.* 19 G Careyana, *Roxb Hort Beng* 2, *Fl Ind* i 80, *Rosc Scit* t 110, *Lodd Bot Cat* t 691, *Wall Cat* 6534, *Horan Prodr* 19 G. orixensis, *Wall Cat* 6535 F Scitaminea Finlaysoniana, *Wall Cat* 6623

PEGU, *Carey* &c

Leafy stem 1 1½ ft *Leaves* 6 in, oblong, acuminate, pale and finely pubescent beneath *Raceme* short erect or drooping, upper half bearing flowers on the rachis or on short branches, lower half with crowded bulbils sessile in the axils of small ovate scariose spreading or ascending bracts *Calyx* ⅙-⅕ in, narrowly funnel shaped *Corolla* yellow, tube 2 3 times the length of the calyx, segments ⅙ in, filament yellow, ⅓-½ in, anther cuspidate, margin very narrow *Capsule* globose, warted, the size of a large pea

12 **G. floribunda,** *Baker*, panicle long lax, branches many-fld, bulbils 0, staminodes scarcely longer than corolla segments, lip long not bifid

MALAY PENINSULA, Johore, *King*

Habit of *G multiflora*, 2 ft high *Leaves* oblong, caudate, nearly 1 ft, pubescent *Panicle* erect, 6-8 in, rachis very hairy, branches 1-1½ in, many, ascending, 6-8 fld, bracts small, deciduous *Calyx* $\frac{1}{12}$ in *Corolla* pale yellow, segments oblong, ⅛ in, anther narrowly margined at the sides and base, lip inserted above the base of the filament *Ovary* glabrous

13 **G. uliginosa,** *Miquel Fl Ind. Bat Suppl* 613? panicle long very lax narrow, lower branches 1-2 fld, upper flowers sometimes replaced by bulbils, corolla segments and staminodes ovate and equal in length, lip small G elongata, *King mss*

PENANG, *King*. MALACCA, *Cuming, Griffith* (*Kew Distrib.* 5632), &c —DISTRIB Malay isles

Stem very weak *Leaves* small, membranous *Panicle* sometimes 6-9 in, bracts small, deciduous *Calyx* funnel shaped, $\frac{1}{12}$ in *Corolla* yellow, tube ¼ in, segments ⅛-⅙ in, filament ¼ in., lip placed a little above its base, anther obscurely margined *Capsule* smooth —I doubt whether Bentham's Sect *Careyella* should be

4 **G. Wallichii,** *Baker*, leaves small glabrous beneath, panicle very long lax-fld, branches 1-2 fld, bracts small deciduous, bulbils few or 0, corolla segments ovate, staminodes lanceolate rather longer, lip small placed a little above the segments, capsule small smooth G pendula, *Wall Cat* 6533, *not of Roxb*

PENANG, *Wallich, Curtis*

Much weaker in habit than other species of the section *Leaves* 3-4 in, caudate,

** *Leaves more or less pubescent beneath*

5 **G. Hookeri,** *Clarke mss*, leaves very hairy on the midrib beneath, panicle long narrow, lower branches 2-3 fld at the tip, bulbils sometimes present, bracts small deciduous corolla segments and staminodes ovate and equal in length, lip longer shortly bifid, capsule smooth

... 5ft *J D H* (*Herb Ind Or*

robust and floriferous with

6 **G. ophioglossa,** *Wight Ic* t 2002 leaves finely pubescent beneath panicle narrow, lower branches 1-6 fld, bracts small deciduous, lower nodes with a few bulbils corolla segments ovate staminodes longer lanceolate, lip longer deeply bifid capsule smooth *Horan Prodr* 19 G orixensis, *Wall Cat* 6535 A, C, D, I, *not of Roxb* Alpinia? Missionis, *Wall Cat* 6580

TRAVANCORE *Heyne*, Anamallay hills, &c *Wight, Jerdon* COCHIN, *Gamble* BEHAR, on Parasnath alt 2500 ft, *Vicary, Clarke*

Leaf conspicuously caudate, 6 9 in *Panicle* 4 6 in, rachis and branchlets glabrous, flowers not crowded at their tips, bulbils ovoid deflexed *Calyx* ⅙ in, broadly funnel shaped pale green, teeth broad ovate *Corolla* pale yellow, tube 3 times the length of the calyx, segments ⅛ in, ovate, lip twice the length of the segments, lobes longer and narrower than in others of the section *Capsule* ¼ in, globose

7 **G. multiflora,** *Wall Cat* 6537 A, leaves pubescent beneath, panicle long narrow, lower branches 4-6 fld, bracts small deciduous, lower noc

len

in

ng species, and flowers not ies the length of the calyx, etimes obscurely margined

8 **G. substrigosa,** *King mss*, leaves very pubescent on both surfaces, panicle lax cernuous branches few fld, bulbils 0, bracts large violaceous persistent, corolla segments ovate, capsule pubescent

TENASSERIM, *Gallatly*

Whole plant not more than 6-8 in *Leaves* few, oblong-caudate, the largest 3-4 in *Panicle* 1½ 2 in, branches few, short, lower spreading or reflexed, bracts oblanceolate oblong pubescent *Calyx* tube ⅛ in *Corolla* yellow, gland dotted *Capsule* blackish, the size of a pea

9 **G. Andersoni,** *Clarke, mss*, leaves slightly pubescent beneath,

panicle lax, flowers crowded at the tips of the branches surrounded by a whorl of large bracts, corolla segments and staminodes equal in length, lip longer deeply bifid, capsule warted

SIKKIM HIMALAYA, alt 1500-2000 ft (*Hk fil & Thoms Herb Ind Or* 12), *Clarke, Gamble, King*

Habit and leaves of *G racemosa* *Leaves* sometimes 1 ft, caudate *Panicle* 3-4 in, erect or spreading, rachis very hairy branchlets short, spreading, bracts ½ in, dark, ovate, membranous *Calyx* green, tubular *Corolla* bright yellow, tube 2-3 times the length of the calyx, segments ⅙ in, filament nearly 1 in

10 **G. arracanensis,** *Kurz in Journ Asiat Soc Beng* xxxix pt ii 83, leaves slightly pubescent beneath, panicle short, flowers crowded at the tips of the short branches surrounded by a whorl of large bracts, corolla-segments ovate lilac lip deeply bifid capsule smooth.

ARRACAN, forests of the low sandstone hills *Kurz*

Habit of *G racemosa* *Leaves* 6-9 in caudate *Panicle* 3-4 in, subsessile, rather spreading bracts ¼ in, much imbricate broadly ovate obtuse, membranous lilac *Calyx* ⅛ in *Corolla* tube short whitish, lip yellow or tinged with lilac, segments obovate-oblong, filament long lilac

SECT II **Careyella,** *Horan* Anther with a narrow entire border

11 **G. sessiliflora,** *Sims in Bot Mag* t 1428, raceme narrow or subspicate, bulbils many on lower nodes, corolla-segments ovate, staminodes longer lanceolate, lip long deeply bifid *Horan Prodr.* 19. G. Careyana, *Roxb Hort Beng* 2, *Fl Ind* i 80, *Rosc Scit* t 110, *Lodd Bot Cat* t 691, *Wall Cat* 6534, *Horan Prodr* 19 G. orixensis, *Wall Cat* 6535 F Scitaminea Finlaysoniana, *Wall Cat* 6623

PEGU, *Carey*, &c

Leafy stem 1-1½ ft *Leaves* 6 in, oblong, acuminate, pale and finely pubescent beneath *Raceme* short, erect or drooping, upper half bearing flowers on the rachis or on short branches, lower half with crowded bulbils sessile in the axils of small ovate scariose spreading or ascending bracts *Calyx* ⅙-⅛ in, narrowly funnel shaped *Corolla* yellow, tube 2-3 times the length of the calyx, segments ⅙ in, filament yellow, ⅓-⅔ in, anther cuspidate, margin very narrow *Capsule* globose, warted, the size of a large pea

12 **G. floribunda,** *Baker*, panicle long lax, branches many-fld, bulbils 0, staminodes scarcely longer than corolla segments, lip long not bifid

MALAY PENINSULA, Johore, *King*

Habit of *G multiflora*, 2 ft high *Leaves* oblong, caudate, nearly 1 ft, pubescent *Panicle* erect, 6-8 in, rachis very hairy, branches 1-1½ in, many, ascending, 6-8-fld, bracts small, deciduous *Calyx* $\frac{1}{12}$ in *Corolla* pale yellow; segments oblong, ⅛ in, anther narrowly margined at the sides and base, lip inserted above the base of the filament *Ovary* glabrous

13 **G. uliginosa,** *Miquel Fl Ind Bat Suppl* 613? panicle long very lax narrow, lower branches 1-2 fld, upper flowers sometimes replaced by bulbils, corolla-segments and staminodes ovate and equal in length, lip small G elongata, *King mss*

PENANG, *King* MALACCA, *Cuming, Griffith* (*Kew Distrib* 5652), &c —DISTRIB Malay isles

Stem very weak *Leaves* small, membranous *Panicle* sometimes 6-9 in, bracts small, deciduous *Calyx* funnel-shaped, $\frac{1}{12}$ in *Corolla* yellow, tube ¼ in, segments ⅙-⅛ in; filament ⅓ in.; lip placed a little above its base, anther obscurely margined *Capsule* smooth — I doubt whether Bentham's Sect Careyella should

separated from *Aplanthera* Neither Miquel's description, nor his type specimen, indicate the structure of the anther in the Malay *G uliginosa*

SECT III **Ceratanthera,** *Lestib* (gen) Anther with a membranous spur from the base or side of each cell

14 **G. Kingii,** *Baker*, panicle narrow subspicate bracts small deciduous bulbils 0 corolla segments oblong, staminodes linear oblong, lip small inserted above the base of the filament

SINGAPORE, *King*

15 **G. stenothyrsa,** *Baker*, panicle erect subspicate, lower nodes bearing bulbils, bracts deciduous, corolla segments oblong staminodes linear-oblong, lip small emarginate inserted above the base of the filament

TENASSERIM, Moulmein, *Parish*

Stem 1 ft or more *Leaves* 6–8 in, oblong, caudate *Panicle* peduncled, 8–9 in, lower half with small sessile bulbils in the axils of small bracts, flowering branches short, ascending, 1–2 fld *Calyx* funnel shaped, 1/12 in *Corolla* bright yellow, tube 1/2 in, segments 1/8 in, staminodes scarcely longer, filament nearly 1 in, spurs membranous, as long as the anther cells

Var ? *Cumingii*, bulbils 0, anther spur shorter Malacca, *Cuming* (No 2370)

16 **G. pallidiflora,** *Baker*, panicle lax erect, branches few fld., bulbils 0, bracts small deciduous, staminodes longer than the whitish corolla segments, lip inserted above the base of the filament

MALAY PENINSULA; Johore *King* 716 717

Stem 1½ ft *Leaves* 8–9 in, oblong, caudate pubescent beneath *Panicle* 2–3 in, peduncle short, branches less than 1 in, ascending or spreading 2–3 fld towards the tip *Calyx* 1/12 in *Corolla* segments suborbicular, 1/12 in, tube 1/4 in, filament 1 in, lip with a spreading base, anther spurs subulate *Ovary* glabrous

17 **G. bracteolata,** [illegible]

TAVOY, *Wallich*, TENASSERIM, *Griffith*, *Helfer*, UPPER BURMA, up to 4000 ft., *King*

[illegible] ...ged with purple beneath, ...g, 3–4 in, lower branches ...ower bracts oblong 1/4–1/3 in ... 1/4 in, segments reflexed, ...–3/4 in, anther-spurs large

18 **G. subscaposa,** *Coll et Hemsl in Journ Linn. Soc.* xxviii 135, panicle sparse erect, bracts small deciduous, bulbils 0, corolla segments oblong, staminodes longer lanceolate, lip long deeply bifid inserted at the base of the filament

UPPER BURMA, Shan hills, 4000–5000 ft, *Collett*

Stem including panicle not above 1 ft Produced *leaves* few and small *Raceme* short, lax, lower branches 1 in, spreading, 3–4-fld *Calyx* funnel-shaped, 1/8 in

Corolla greenish yellow, segments ⅜ in ; lip pale yellow, ¼ in , filament above ⅛ in , anther spurs from the sides of the cells

19 **G. pendu**... *Pl* t 228, panicle ... corolla-segments o... above the base of t... *Cat* 6537 B

... imes 1 ft , lowe... not longer than... ube 3 times the... not longer than the corolla segments, anther oblong spurs linear subulate longer than the cells *Ovary* globose, smooth —I doubt the specific distinctness of the Javan *G maculata*, Blume, Enum i 63

SECT IV **Marantella,** *Horan* *Anther* winged on each side by a bifid quadrate membranous process

20 **G. cernua,** *Baker* panicle very lax few fld cernuous, bracts minute deciduous bulbils 0, staminodes longer than the corolla segments lip placed a little above the base of the filament, anther wings spreading

MALA...
Stem ... pubescent beneath *Panicle* ... in *Corolla* pale yellow; ... the base *Ovary* glabrous

21 **G. pauciflora,** *King mss* , panicle very lax few-fld , bracts minute deciduous, bulbils 0, corolla segments oblong, staminodes not longer than the corolla segments, lip placed a little above the segments, anther wings spreading

ANDAMAN ISLANDS, *King s Collector*, 376
Whole plant ½–1 ft *Leaves* oblong, caudate, 2–3 in , minutely pubescent beneath *Panicle* short, erect , lower branches 1 in., ascending, 1–2-fld *Calyx* glabrous, ⅛ in *Corolla* pale yellow , segments ⅛ in *Capsule* glabrous

22 **G. versicolor,** *Smith Exot Bot* t 117 A, B, C, panicle broad very lax, bracts small deciduous, corolla segments oblong, staminodes longer lanceolate, lip small placed a little above the segments anther-wings deflexed *Horan Prodr* 20 G Hura, *Roxb in Asiat Res* xi 359, *Fl Ind* i 79 G expansa, *Wall Cat* 6536 Hura siamensium, *Koenig in Retz Obs* iii 49

MALAY PENINSULA, *Roxburgh* From PEGU to SINGAPORE, *Roxburgh*, and PENANG SOUTH ANDAMANS *Kurz*
Stem 1–1½ ft *Leaves* 4–8 in , oblong caudate *Panicle* 3–6 in , rachis and ... the upper half *Calyx* green, ... segments half as long as the ... eeply bifid, yellow, quadrate,

... **G.** ... acts small leafy per... aminodes longer than ... the filament, anther-

PERAK, alt 2 3000 ft, *King's Collector*, 2414

Stem 1 ft *Leaves* about 5, oblong caudate 4–5 in, finely pubescent beneath *Panicle* ½ ft, main bracts ⅙–¼ in lower 4–5 bulbilliferous branches spreading, 5 6 fld *Calyx* ⅙ in *Corolla* segments pale yellow staminodes ⅓ in *Ovary* rugose —Very near *G Schomburgkii*, Hook f in Bot Mag t 6298 of Siam

24 **G. bulbifera,** *Roxb in Asiat Res* xi 358, *Fl Ind* i 78, spike lax, bracts ovate ascending persistent, lower nodes bearing bulbils, corolla-segments ovate, staminodes rather longer oblong, lip small deeply bifid, anther wings spreading *Thw Enum* 315 G marantina *Wall Cat* 6532, *Dalz & Gibs Bomb Fl* 272, *Blume Enum* i 62 G bracteata *Herb Heyne* G bracteosa *Horan Prodr* 20 G marantinoides *Wight Ic* sub t 2001 G strobilifera, *Zoll & Moritz Syst Verz* 84, *Miq Fl Ind Bat* iii 591

EASTERN HIMALAYA and TROPICAL INDIA, MALABAR the MALAY PENINSULA and CEYLON —DISTRIB Malay Islands, Timor

Stem not so stout as in *G marantina*, *Spike* 3 4 in bracts ¼ 1 in, green not enclosing ovoid bulbils *Flower* and sta quadrate yellow deeply bifid anther wings cells

25 **G. marantina,** *Linn Mant* ii 170, spike dense, bracts imbricate persistent, lower nodes bulbilliferous, staminodes oblong rather longer [illegible], anther wings spreading *Smith Exot Bot* ii 8[illegible], 77 *Miq Fl Ind Bat* iii *Cant* edit 1

[illegible]

Ovary smooth

SPECIES IMPERFECTLY KNOWN (Anthers not seen)

26 G CANARENSIS, *Baker*, leaves small thin caudate panicle narrow erect very few- and lax-fld, most of the flowers replaced by long narrow acuminate bulbils, calyx green narrowly funnel-shaped ⅛ in corolla tube more than twice as long as the calyx corolla segments oblong ⅛ in —Canara *Law*

[illegible] ves large and thin panicle short lax and very a bulbil and bearing numerous close flowers ach subtended by a small persistent ovate dly funnel shaped ⅟₁₂ in corolla tube 3 times the length of the calyx segments oblong yellow ⅙–⅕ in —Canara, *Law* (Hk f & Thoms Herb Ind Or 11)

3 HEMIORCHIS, *Kurz*

[illegible]

ctive narrow not produced

Ovary 1 celled, placentas 3, parietal, style filiform, stigma small, subglobose *Capsule* small, 1-celled, 3 valved *Seeds* conical, aril white

H. burmanica, *Kurz in Journ Asiat. Soc Beng* xlii pt ii 108, t 8, *Baker in Bot Mag* t 7120

KHASIA HILLS, *Mann* PEGU, MARTABAN and TENASSERIM, *Kurz*

Habit of *Gastrochilus* *Rhizome* white, hypogæous *Leaves* few, oblong, acute *Peduncle* with spike ½-1 ft, very pubescent, as are the rachis and calyx *Spike* dense upwards, bracts small, lanceolate deciduous *Calyx* funnel shaped reddish-brown, ¼ in, cleft below the middle *Corolla lobes* reddish brown, staminodes about ½ in, greenish-white, lip whitish minutely dotted with red-brown, stamen half as long as the corolla segments *Capsule* globose, 10 grooved, crowned by the persistent acute calyx lobes

4 ROSCOEA, *Smith*

Root fibres thick, fleshy, fascicled, rootstock 0 *Leaves* lanceolate or oblong *Flowers* in terminal spikes bracts persistent, 1 fld *Calyx* long, tubular, slit down one side *Corolla tube* slender, as long as or ... ding upper broad cucullate, ... ral staminodes oblanceolate, ... fid or emarginate filament ... connective produced at the base into a forked appendage *Ovary* 3 celled, cylindric or oblong, ovules very numerous, superposed style erect, stigma turbinate margins ciliate *Capsule* cylindric or clavate, membranous tardily 3-valved *Seeds* ovoid, minute, arillate —One species in Cochin China, and the following

1 **R. alpina,** *Royle, Ill* 361 t 89, stem short produced leaves 2-3 sessile oblong-lanceolate spike sessile 1-2 fld, corolla tube much longer than the calyx limb dark purple upper segment orbicular, lip broad deeply bifid *Wight Ic* t 2013, *Horan Prodr* 20 R purpurea, *Royle l c* t 89, f 3 R purpurea *var* minor, *Wall Cat* 6528 D, E

TEMPERATE CENTRAL and WESTERN HIMALAYAS, from KASHMIR to NEPAL, ascending to 11 000 ft

Whole plant 4-6 in high *Leaves* 3-4 in, under and not fully developed at the flowering time *Calyx tube* green, 1 in or more, slit nearly to the base *Corolla tube* white, 1 in, longer than the calyx, upper segment orbicular cuspidate, erect, ½-¾ in long and broad, lateral ½ in, linear-oblong, deflexed *Staminode* oblong-spathulate, half as long as the upper segment, fertile stamen as long as the staminode, lip obovate cuneate, ½-¾ in, bifid about one third of its length

2 **R. purpurea,** *Smith Exot Bot* ii 97 t 108, leafy stem elongate, produced leaves 5-6 lanceolate, flowers few in a sessile spike, corolla-tube not longer than the calyx, limb purple rarely pale lilac or white, upper segment obovate-cuneate, lip broad deeply bifid *Hook Exot Fl* t 144, *Bot Mag* t 4630, *Rosc Scit* t 64, *Lodd Bot Cab* t 1404, *Horan Prodr* 20, *Wall Cat* 6528 A, B

CENTRAL and EASTERN HIMALAYA, from KUMAON to SIKKIM, ascending to 10,000 ft ASSAM, the KHASIA HILLS, and BURMA

Leafy *stem* ½-1 ft long *Leaves* 6 by ½-1 in at flowering time; sheaths broad,

segment, fertile stamen as long as the staminode, anther-tails ⅛ in ; lip 1–1½ in, deflexed Capsule cylindric, 1–1½ in —Varies greatly in robustness, breadth of leaves and colour and size of flowers Var *R exilis*, "Smith," Horan Prodr 21,

all Cat 6523 C, taller, more
R purpurea, *Lindl in Bot*

ower and perianth-tube longer

3 **R. capitata,** *Smith in Trans Linn Soc* xiii 461, stem elongated, leaves many linear, flowers many in a dense oblong peduncled spike, corolla tube not longer than the calyx, limb pale blue upper segment oblong cuneate lip narrow emarginate *Wall Pl As Rar* t 255, *Cat* 6529, *Horan Prodr* 20

NEPAL *Wallich, Scully*

Stem ½–1 ft or longer *Leaves* erecto patent, ½–1 ft by ½ in *Peduncle* erect, 3–6 in *Spike* 1½ 2 in, bracts green, lanceolate, 1 1½ in *Calyx* 1 in, green, minutely 2 toothed, slit deeply down one side Upper *corolla segment* ¾ in, arcuate, very concave; lower rather longer, oblanceolate deflexed *Staminode* nearly as long as the upper segment, lip 1 by ¾ in, oblong spathulate *Capsule* 1 in, clavate

IMPERFECTLY-KNOWN SPECIES

4 R LONGIFOLIA *Baker*, stem short produced leaves about 6 outer oblong inner 12 in linear or lanceolate flowers 1–3 in a sessile spike, calyx tube slender cylindric 1½ in, corolla tube twice as long, limb not seen, capsule shortly pedicelled clavate above an inch long —SIMLA, on Fagu, *Thomson*

5 CAUTLEYA, *Royle*

Characters of *Roscoea*, but flowers yellow, dorsal lobe of the corolla narrow, and capsule dehiscing to the base with recurved lobes exposing the seeds in a columnar mass —Species, the following

1 **C. lutea,** *Royle Ill* 361
or oblong lanceolate, bracts obl
seeds black angular exarillate
gracilis *Smith in Trans Linn S*
elatior *Sm th l c*, *Wall Cat* 6
f 2, *Wight Ic* t 2013

TEMPERATE HIMALAYA, from Kashmir to Sikkim, ascending to 7–8000 ft
KHASIA HILLS *J D H & T T*

Stem 12–18 in slender *Leaves* 6–9 by 1–1½ in at flowering time usually

lobes oblong *Capsule* ½ in, bright red, globose, valves ovate, reflexed, red inside *Seeds* black, angled, top flat

2 **C. Cathcarti,** *Baker*, spike dense many-fld, leaves sessile lanceolate or oblong lanceolate, bracts green oblong shorter than the calyx, seeds black angular exarillate

SIKKIM HIMALAYA, alt 7–8000 ft, *Griffith's Collectors*, &c

Very near *C lutea*, but more robust, flowers twice or thrice as many, bracts

larger, calyx longer and lip broader, with crisped margins, capsule and seeds quite similar

3 **C. spicata,** *Baker*, spike dense many fld, leaves oblong acuminate sessile or shortly petioled, bracts red as long as the calyx, seeds not angled completely enclosed in a white scariose aril Roscoea spicata, *Smith in Trans Linn Soc* xiii 461, *Wall Cat* 6530, *Horan Prodr* 21

CENTRAL and EASTERN HIMALAYAS from Kumaon to Sikkim, ascending to 8500 ft

Stem 1 2 ft *Leaves* sometimes 3–4 in broad, not purple beneath *Spike* shortly p duncled, 6–9 in, bracts oblong, bright red, lower 1–1½ in *Calyx* 1 in, tubular, red, minutely obtusely toothed, finally slit deeply down one side *Corolla-tube* as long as the calyx, upper segment about 1 in, lip bright yellow *Staminodes* nearly as long as the upper segment of the corolla oblanceolate oblong *Capsule* small, red, globose *Seeds* ⅛ in, black, ovoid or flattened by pressure

4 **C. robusta,** *Baker*, spike dense many fld, leaves sessile oblong acute, bracts linear oblong reddish as long as the calyx, seeds pink not angled enclosed in a red or yellow arillus

SIKKIM HIMALAYA, alt 5500–6500 ft, *Clarke*

Leaves 1 ft or less by 3 in or more *Spikes* peduncled 6–9 in; bracts 1 in *Corolla* not seen *Capsule* depressed globose, ½ in diam *Seeds* ovoid or compressed, forming a dense mass ½ in diam, entirely enveloped in the scarious aril

5 **C. petiolata,** *Baker*, spike dense many fld, leaves petioled oblong lanceolate caudate, bracts oblong reddish shorter than the calyx Roscoea petiolata, *Royle mss*

GARWHAL HIMALAYA, between Dehra and Landour, alt 7000 ft, *Royle*

Stem 1 ft or more *Leaves* 6 by 1½–2½ in, shortly petioled erecto patent *Spike* 3–4 in, nearly sessile, bracts oblong, reddish nearly 1 in *Calyx* 1 in reddish, obscurely bidentate slit deeply down one side Upper *corolla segment* and lip pale sulphur yellow, under 1 in *Staminode* and stamen nearly as long as the upper segment —Known only from an unpublished figure of Royle's artist

6 **CURCUMA,** *Linn*

Rootstock tuberous, bearing sessile and long stipitate tubers, stem in dense com na of coloured several brac- ort cylindric, ually ovate or oblong, upper longer and more concave *Lateral st i minodes* oblong, petaloid, connate with the short filament, anther not crested, cells contiguous, spurred at the base lip orbicular tip deflexed *Ovary* 3 celled, many ovuled, style filiform stigma 2 lipped lips ciliate *Capsule* globose, membranous, finally 3 valved *Seeds* ovoid or oblong, usually arillate — India, Siam Malay Islands and N Australia

the several sections

Sect I **Exantha,** *Horan* *Flower spike* vernal or lateral, distinct

from the leaves, and usually developed before they appear, peduncle sheathed by scariose bract leaves

1 **C. angustifolia,** *Roxb in Asiat. Res* xi 338, t 3, *Hort Beng* 1; *Fl Ind* i 31, dwarf rootstock small globose leaves lanceolate plain green shortly petioled, bracts of the coma pink, lobes of the corolla pale yellow *Royle, Ill* 357, 359, *Horan Prodr* 22 C longa, *Wall Cat* 6605 E, F, G

4000 ft NORTH OUDH ... long fibres. *Leaves* with ... by 2 3 in *Spike* with ... bracts 1 in, green, ovate, pink, bracts of coma few or many *Corolla tube* ½ in, upper segment ovate, lateral shorter, oblong *Staminode* and lip bright yellow, the latter orbicular cuneate, emarginate —Similar plants in flower and not distinguishable in a dried state are found in Upper Burma alt 4000 ft *Collett, Prain*, and in Munnipore, alt 5000 ft *Watt*

2 **C. neilgherrensis,** *Wight Ic* t 2006, dwarf, rootstock small, white inside, leaves lanceolate pale green shortly petioled, bracts of coma pink, lobes of corolla pale ovate *Horan Prodr* 22 C longa *Wall. Cat* 6605 C C angustifolia *Dalz & Gibs Bomb Fl* 274, *not of Roxb*

CONCAN, at Ramghaut MALABAR, abundant on the S W slope of the Nilghiris, alt 4500–6000 ft

Very near *C angustifolia* *Leaf* and petiole together 12 in or more, blade glabrous beneath, narrowed gradually from the middle to both ends *Spikes* vernal, 2–4 by 1½–2 in diam, flowering bracts pale yellowish green, 1 1½ in *Flowers* 1 in, bright yellow, l p orbicular, deflexed, emarginate

3 **C. aromatica,** *Salisb Parad* t 96, *in Trans Hort Soc* i 285, rootstock large tubers sessile yellow and aromatic inside, petiole long green, leaves large oblong pubescent beneath, bracts of the coma pink, lobes of corolla pinkish white *Rosc Scit* t 103 *Wight Ic* t 2005, *Thw Enum* 316, *Horan Prodr* 23 C Zedoaria *Roxb in Asiat Res* 333, *Hort Beng* 1, *Fl Ind* i 23, *Wall Cat* 6601 A, *Dalz & Gibs Bomb Fl* 274, *Bot Mag* t 1546, *Grah Cat Bomb Pl* 209

Throughout INDIA from the EASTERN HIMALAYA to CEYLON, wild and frequently cultivated

Rootstock tuberous biennial, 1 in diam *Leaves* 3–4 ft petiole as long as the blade which is 1–2 ft by 4–8 in, caudate, base deltoid, plain green above or variegated with lighter and darker green clothed beneath with fine persistent pubescence ... the leaves ... 1½–2 in, the ... shorter than ... segments obl... corolla segme... obscurely 2-lobed

4 **C. Zedoaria,** ... e, sessile tubers pale ... rge oblong glabrous ... of the coma bright ... oran Prodr 23 C ... 1, *Fl Ind* i 20, ... *Cat Pl Bomb* 209,

Royle Ill 859, *Thw Enum* 316 C officinalis, *Salisb in Trans Hort Soc* i 285 C speciosa, *Link Enum* ii 3 Amomum Zedoaria *Berg Mat. Med* 41, *Willd Sp Plant* i 7 A Zerumbeth, *Kænig in Retz Obs* iii 55 A latifolium, *Lamk. Ency* i 134—*Rumph Amboin* v 108, *Rheede Hort Malab* xi t 7

EASTERN HIMALAYA, wild, cultivated throughout India —DISTRIB Malay Islands

Rootstock ovoid, tubers many, some 1 in diam, sessile cylindric, and many ... ite narrowed to the ... n broad, flowering ... s of the coma many ... the bracts *Calyx* whitish, obtusely toothed scarcely half as long as the corolla-tube *Corolla tube* funnel shaped, lateral segments oblong upper rather longer ovate, convex *Lip* ½ in broad, orbicular, deflexed obscurely 3 lobed emarginate *Capsule* ovoid-trigonous, smooth, dehiscing irregularly *Seeds* oblong, aril lanceolate white

5 **C. elata,** *Roxb Hort Beng* 1 *Fl Ind* i 25, rootstock large, sessile tubers pale yellow inside, petiole long green, leaves large oblong plain green pubescent beneath bracts of coma bright red lobes of corolla whitish *Rosc Scit*. t 104, *Wall Cat* 6610, *Horan Prodr* 23

BURMA, *Carey*

... *y tuft* 6–8 ft, blade 2–3 by 1 ft ... bracts 1½ in ovate, green, the ... *Flowers* pale yellow shorter tha ... emarginate —Very near C *Zedoaria*

6 **C. comosa,** *Roxb in Asiat Res* xi 336, *Hort Beng* 1, *Fl Ind* ... few pale yellow inside, petiole long ... en glabrous beneath, bracts of coma ... sh white *Wall Cat* 6609 A, *Horan Prodr* 23

PEGU, *Carey*

Leafy tuft 5–6 ft, blade 2–3 ft, plain green except in the earliest leaves, which are clouded with faint brown down the centre *Spike* vernal, denser and thicker than in *C Zedoaria*, flower bracts pinkish white those of the coma many, bright red, 2–3 in, spreading *Flowers* pale yellow —Very near *C Zedoaria*

7 **C. ornata,** *Wall mss ex Voigt Hort Suburb Calc* 564 (name only), rootstock large, sessile tubers 0 leaves ovate clouded in the centre when young, bracts all white tipped with mauve purple, lobes of the corolla tinged with red

PEGU, *Wallich*

... *Leaves* 3 4 in ... o, 2 in ... h yellow —Closely allied to *C comosa*

8 **C. latifolia,** *Rosc Scit* t 108 very tall rootstock large sessile tubers pale yellow inside, petiole long green leaves large oblong clouded down the middle with purple pubescent beneath bracts of the coma bright red, lobes of the corolla whitish *Horan Prodr* 23

BENGAL?, *Carey*

Very near *C Zedoaria* & *aromatica* *Leafy tuft* 8–12 ft , blade 3 4 by 1 ft or more *Spike* produced vernal, 6–8 in , 3 in diam , flower bracts green, ovate, 1½ in , of the coma many, longer and more oblong *Flowers* pale yellow, rather shorter than the bracts, lip obscurely emarginate —Sent by *Carey* from Serampore to the Liverpool Botanical Garden, origin unknown

9 **C. leucorhiza,** *Roxb in Asiat Res* xi 337, *Hort Beng* 1, *Fl Ind* i 30, rootstock large, sessile tubers nearly white inside, petiole long green, leaves large oblong plain green glabrous beneath, bracts of the coma pink lobes of the corolla nearly white *Rosc Scit* t. 102, *Wall Cat.* 6607, *Horan Prodr* 22

BEHAR, jungles south of Bhagulpore, *Glass*

Very near *C Zedoaria* & *aromatica* *Rootstock* large, ovoid, sessile tubers cylindric, sometimes nearly 1 ft *Leafy tuft* 3–4 ft , blade 1–2 ft by 5–6 in , broad at the middle, plain green and glabrous on both sides *Spike* vernal, coma nearly as long as the fertile portion, flower-bracts green, obtuse 1½ in , bracts of the coma longer, more oblong *Flowers* pale yellow, rather shorter than the bracts, central lobe of the lip distinctly emarginate

10 **C. [illegible]** [illegible] 1, *Fl Ind* [illegible] long green, [illegible] the middle, [illegible] *oran Prodr* 22.

BENGAL, *Roxburgh*

Rootstock ovoid, sessile tubers longer and not so thick as in *C æruginosa* *Leafy tuft* about 3 ft , blade 1–1½ ft by 5–6 in , glabrous beneath *Spike* produced, [illegible] bracts [illegible] shorter [illegible] nate — [illegible] in the

11 **C. [illegible]** [illegible] *Asiat Res* xi 335, *Hort Beng* 1, *Fl* [illegible] tubers palmate verdigris green inside, [illegible] oblong green faintly tinged with red-brown down the middle, bracts of the coma pink, lobes of the corolla pale red *Rosc Scit* t. 106, *Salisb in Trans Hort Soc* i 285, *Wall Cat* 6606, *Horan Prodr* 22

BURMA, *Carey*

[illegible]

12 **C. amarissima,** *Rosc Scit Pl* t 101, rootstock large, sessile tubers yellow and very bitter inside, petiole long red brown, leaves large oblong plain green bracts of the coma whitish tipped with pink, lobes of the corolla red *Horan Prodr* 23

BENGAL?, *Carey*

Rootstock very large, yellow in the centre, æruginose towards the outside *Leafy tuft* 3 ft , blade 1–1½ ft by 5–6 in *Spike, bracts* and *flowers* as in *C Zedoaria* —Sent by *Carey* in 1824 from Serampore to the Liverpool Botanic Garden, probably a native of Bengal

C. ... *Beng* 1, *Fl*
ry fragrant
... red brown
the corolla

BENGAL, *Roxburgh*
Rootstock ovoid, sessile tubers very stout *Tuft of leaves* 4–5 ft, blade 1–1½ by 5–6 in *Spike* vernal, flowers few, large, fertile bracts tinged with red-brown, those of the coma few bright red, lip above ½ in diam, obscurely emarginate

14 **C. rubescens,** *Roxb in Asiat Res* xi 336, *Hort Beng* 1, *Fl Ind* i 28, rootstock large, sessile tubers white inside petiole long red-brown leaves large oblong green with a red brown midrib bracts of the coma few pale red, limb of the corolla reddish *Rosc Scit* t 107, *Horan Prodr* 23 C erubescens, *Wall Cat* 6608 C longiflora, *Salisb in Trans Hort Soc* i 286 C rubricaulis, *Link Enum* i 3

BENGAL, *Roxburgh*
... y on long fibres *Leafy tuft* ... vernal produced apart from leaves in September, 5–6 in, those of the coma few, ovate, ... the bracts, lip ½ in diam, emarginate

SECT II **Mesantha,** *Horan* *Flower spike* autumnal, in the centre of the tuft of leaves, bracts not recurved at the tip

15 **C. attenuata,** *Wall Cat* 6602, rootstock small, petiole long slender, leaves lanceolate, flower bracts small, those of the coma oblong tinged with red, flowers ?

BURMA, banks of the Irrawaddy, *Wallich*
Rootstock globose sessile tubers oblong *Leafy tuft* 2½–3 ft, petiole as long as the blade which is firmer in texture than is usual in the genus quite glabrous 1–1½ ft by 1 in tapering gradually to the base and a long point *Peduncle* 1 ft, slender, erect, spike dense, 3–4 in by 1 in diam, flower bracts under 1 in, membranous, very obtuse, bracts of the coma few, 1 in, bright coloured *Flowers*, withered only seen

16 **C. plicata,** *Wall Cat* 6611, rootstock small, petiole slender long or shorter, leaves firm oblong lanceolate, flower bracts green, those of the coma much tinged with red, flowers small pale yellow

BURMA and PEGU, *Wallich, J Anderson*
... *Leafy tuft* 9–18 in, petiole as ... tapering gradually to both ends, ...ntre *Peduncle* slender 2 ... in ..., pale green very obtuse those of the coma few, rather longer and more oblong *Flowers* rather longer than the bracts *Corolla* whitish, ½ in diam, upper lobe ovate, lip obscurely 3 lobed, midlobe emarginate

17 **C. Amada,** *Roxb in Asiat Res* xi 341, *Hort Beng* 1, *Fl Ind*

BENGAL and the CONCANS, native and widely cultivated, under the name of Mango Ginger

cylindric *Leafy tuft* 2-3 ft., petiole as y 6 in or more in breadth plain green, *Peduncle* ½ ft or more, hidden by the umnal, 3 6 in by 1½ in diam, flower- with pink *Flowers* about as long as low —Not distinguishable in Herbarium specimens from *C longa*

18 **C. longa,** *Linn Sp Plant* 2, rootstock large, sessile tubers

Horan Prodr 23 Amomum Curcuma, *Jacq Hort Vind* iii t 4 —*Rheede Hort Mal* xi t 11 *Rumph Amboin* v t 67

Widely cultivated in BENGAL and other parts of INDIA

19 **C. montana,** *Rosc in Trans Linn Soc* viii 355, rootstock

CONCAN and the CIRCARS, *Roxburgh* &c

subequal, lip longer, deflexed only), which is cultivated or allied A flowerless specimen ... sent by Mr Duthie, furnishes no distinctive characters

20 **C. Kuntsleri,** *Baker*, petiole long, leaves oblong narrowed to the base, bracts very broad all pale green, coma 0, flowers yellow

PEGU, *Kunstler* (*Hort Calcutt* 1882)

Rootstock not seen *Leaf blade* under 1 ft, 4-6 in broad, acute, green above, tinged with purple beneath petiole 5-6 in, robust, deeply channelled *Peduncle* very short, spike short, 2 in diam, without any coma of coloured bracts; flower-bracts 1½ in long and broad *Corolla* tube as long as the bract, segments lanceolate, ½ in, lip obovate-cuneate, rather longer than the corolla-segments, yellow throughout, emarginate —Near *C montana*

21 **C. reclinata,** *Roxb in Asiat Res* xi. 342, *Hort Beng* 1, *Fl Ind* i 36, rootstock small, sessile tubers 0, petiole short, leaves thin oblong

obtuse, flower bracts green tinged with red, those of the coma reddish, flowers reddish yellow *Horan Prodr* 24

CENTRAL INDIA, *Colebrooke*

Rootstock oblong, bearing many subglobose tubers at the end of fibres *Leaves* plain green, obtuse, rounded at base, 6–8 by 3–4 in , petiole shorter than the blade *Peduncle* very short *Spike* autumnal oblong, 3–4 by 2 in diam , bracts 1 in , those of the coma oblong, ascending, similar to flower bracts in colour *Flowers* small, dull red, except the yellow orbicular emarginate lip

22 **C. decipiens,** *Dalz in Kew Journ* ii (1850), 144, rootstock small, sessile tubers 0, petiole short leaves thin cordate ovate cuspidate bracts and flowers purple *Dalz & Gibs Bomb Fl* 274, *Horan Prodr* 23

The CONCAN, *Dalzell Law*

Rootstock bearing numerous small almond like tubers at the end of fibres *Leaves* thin, 6–8 in by 3–4, base rounded tip, deltoid with a small cusp, petiole as long as the blade *Spikes* æstival earlier lateral, later central 4–6 by 1½–2 in , peduncle short, lower bracts ovate 1 in , many upper sterile, longer, oblong, flower shorter than the bract lip bifid, margins curled

23 **C. albiflora,** *Thw Enum* 316, rootstock small sessile tubers 0, petiole short, leaves small oblong rounded at the base, flower-bracts green all fertile, flowers white with a yellow spot on the lip *Hook f in Bot Mag* t 5909

24 **C. oligantha,** *Trimen in Journ Bot* 1885 245, rootstock small, sessile tubers 0 petiole short leaves small ovate narrowed to the base, flower bracts green all fertile flowers white with a yellow spot on the lip

CEYLON, Central Province near the Mahaweli river *Trimen*

Near *C albiflora* *Leaves* 5 7 in thin bright light transparent green, with distinct veins and transverse veinlets *Peduncle* short slender, spike 4–6 in , bracts green, appressed acuminate, flowers few erect large for the genus *Corolla* tube 1 in , segments long pinkish *Staminode* subacute, crisped pure white, lip broad deeply bifid, with a yellow stain at the throat *Seeds* oblong, grey, shining exarillate

SECT III **Hitcheniopsis,** *Baker* *Spike* autumnal from the centre of the tuft of leaves, bracts very obtuse, adnate at the sides and spreading at the tip

25 **C. parviflora,** *Wall Pl Asiat Rar* i 47, t 57 rootstock small, leaves small oblong rounded to the base fertile bracts green, those of the coma greenish white, lip violet *Horan Prodr* 24

[illegible] *Wallich*

[illegible] form tubers *Leaves* about six

to [illegible] ½ ft by 2–3 in veins darker

gree[illegible] clasping petioles spike oblong,

2 in by 1 in diam , flower bracts ¾ 1 in , very obtuse, tips spreading *Flowers*

as long as the bracts *Corolla* segments small, ovate; staminodia oblong, white, as long as the corolla segments, lip longer, obovate-cuneate, obscurely emarginate

26 **C. strobilifera,** *Wall Cat* 6599, rootstock small, leaves small oblong, bracts all green, flowers pale yellow C strobilina, *Wall. mss.*, *Grah Cat Pl Bomb* 210

PEGU, near Rangoon, *Wallich*

Rootstock bearing a few globose sessile tubers *Leaves* about six to a tuft, petiole green, deeply channelled 6–8 in, leaves 6–8 by 2½–3 in, bright green, acute, base rather rounded darker green along the veins *Peduncle* much shorter than the petioles spike oblong, 3 4 in by 2 in diam, bracts all similar, green, very obtuse spreading at the tip *Flowers* about as long as the bracts *Corolla* segments small, whitish, lip short, deflexed, orbicular, distinctly emarginate.

27 **C. grandiflora,** *Wall ex Voigt Hort Suburb Calc* 565 (*name only*), rootstock small, leaves small oblong acute, bracts all pale green, flowers pale yellow

MALAY PENINSULA, *Wallich*

Rootstock oblong, fibres not bearing tubers *Leaves* 6–8 to a tuft, petiole deeply channelled 6–10 in blade 6–8 by 3–4 in, cuspidate base rounded, darker green along the veins. *Peduncle* much shorter than the petioles *Spike* oblong, 3–4 in, bracts all similar, very obtuse, spreading at the tip *Flowers* rather longer than the bracts *Corolla* segments ovate or oblong, staminode short and broad, lip ⅔ in, broad obscurely emarginate, both primrose yellow

28 **C. petiol.** [illegible]
base rounded, flow [illegible]
yellowish white [illegible]
Mag t 5821 C [illegible]
Horan Prodr 23, *Hook Bot Mag* t 4135 C cordifolia, *Roxb Hort Beng* 1

BURMA PEGU, and TENASSERIM, *Roxburgh* &c

Rootstock with a few sessile tubers pale yellow inside and many at the end of fusiform fibres *Leaves* 4–6 to a tuft, petiole ½–1 ft blade 6–9 in thin cuspidate. *Peduncle* much shorter than the petioles, spike ½ ft by 2 in diam, flower bracts 1½ in, very obtuse, spreading at the tip, those of the coma similar in size and shape, but brightly coloured *Flowers* nearly as long as the bracts *Corolla* tube nearly an inch long, upper segment convex, cuspidate, lip suborbicular, deflexed, emarginate

29 **C. Roscoeana,** *Wall Pl Asiat Rar* i 8 t 9 *Cat* 6597, [illegible] the flowers
[illegible] *Bot Mag* t
[illegible], *Wall mss*

BURMA and PEGU, *Wallich*

Rootstock without sessile tubers, but with many small ones at the end of the fibres *Leaves* 6–8 to a tuft, petioles ½–1½ ft, blade 6–12 in, cuspidate, bright green, darker along the veins *Peduncle* short, hidden by the sheathing petioles; spike 6–8 in, by 2–3 in diam, bracts very obtuse, adnate at the sides and spreading at the tip, those of the coma similar in size, shape and colour to the lower ones *Flowers* about as long as the bracts *Corolla* ½ in diam, segments oblong, subequal, limb ½ in diam, staminodes oblong, lip orbicular, entire

IMPERFECTLY KNOWN SPECIES

C KURZII, *King mss*, nearly allied to *C petiolata*, but leaves larger, petioles longer, scape longer, bracts more imbricating, and their tips less spreading — S Andaman Islds

7 GASTROCHILUS, *Wall*

Perennial, rarely annual, roc[illegible] or slender *Leafy stem* absent o[illegible] solitary or spicate, often secund[illegible] slender, segments equal, con[illegible] staminodes petaloid, broader th[illegible] filament very short, anther cell[illegible] spurred, lip oblong longer th[illegible] oblong, 3 celled, ovules few or[illegible] subglobose *Capsule* oblong [illegible] one other species from China

1. **G. longiflora,** *Wall Plant Asiat Rar* i 22, t 25, *Cat* 6589, perennial, stemless, leaves large long petioled often cordate, flowers 1–2 in radical spikes, corolla-tube much longer than the bracts staminodes white rather longer than the white corolla segments *Hook in Bot Mag* t 4010, *Horan Prodr* 22 Alpinia Hamiltoniana, *Wall Cat* 6570 Banghium sulphureum, *Ham mss*

SIKKIM HIMALAYA, KHASIA HILLS, ASSAM and from PEGU and UPPER BURMA to MALACCA

Root fibres tufted, cylindric *Leaves* about 4 in a tuft petiole long erect, channelled; blade [illegible]–1 ft or more, base cordate or cuneate oft n tinged purple beneath *Scape* radical, bracts about 2 in many, imbricate scarious oblong [illegible]

the lip clouded with purple

2 **G. minor,** *King mss* perennial, stemless leaves oblanceolate oblong long petioled, corolla tube not longer than the bract, staminodes and lip scarcely longer than the corolla segments

PERAK, *King's Collector*

Root stock slender widely creeping *Leaves* 1 4 in a tuft, petiole 3 4 in, blade 4–5 in, glabrous moderately firm, narrowed to the base *Flowers* several in a sessile spike, bracts 2 in, lanceolate, membranous Corolla tube slender to the apex, segments 1 in, oblong, whitish lip oblong marked with red and yellow, with a decurved tip and incurved margins

3 **G. [illegible]** [illegible]

bract, staminodes white not longer than the white corolla segments *Paxt Mag Bot* vii 75, with fig, *Bot Mag* t 3930, *Horan Prodr* 22

PEGU, *Wallich*, TAVOY, *Gomez*, TENASSERIM, *Helfer*, *Lobb Parish*, PENANG, *Maingay*

4 **G. tillandsioides,** *Baker*, perennial, stem 0, leaves distinctly petioled, flowers many in a long subsessile spike with imbricate bracts, staminodes linear oblong not longer than the corolla segments

?PERAK, *Kunstler*

Leaves 6–8 in, oblong, subacute, base rounded, green above, purplish beneath, petiole nearly or quite as long as the blade *Spike* 6 in, bracts 20–30, oblong, about 1 in *Staminodes* ⅓–½ in, whitish, size, lip orbicular-cuneate, ½ in. long at the throat, stamen half as long Described from a specimen cultivated

5 **G. rubrolutea,** *Baker*, perennial, leafy stem produced, leaves tarrow in the

KHASIA HILLS, *J D H & T T. Clarke*

Leafy stem ½–1 ft or more *Leaves* 6–8 in narrowed to the base *Spike* 2–3 in, as long as its peduncle or scape, much narrower and fewer flowered than in *G pulcherrima*, bracts few, small, closely sheathing the scape *Corolla* segments 1 in, staminodes yellow, ⅓ in broad, stamen nearly as long as the staminodes, lip oblong cuneate, panduriform, upper half red, lower yellow

6 **G. parvula,** *Wall Cat* 6590, annual, stem short, leaves small shortly petioled oblong flowers solitary from the centre of the leaves, corolla tube not longer than the bract, staminodes longer than the corolla-segments

TAVOY, *Gome.*

A dwarf annual, with 3-4 acute membranous leaves 1½–2 in long at the top of a short stem *Root fibres* all slender *Bract* green, under 1 in, wrapped tightly round the corolla tube its base hidden by the sheath of the uppermost leaf *Corolla-segments* linear-oblong, greenish, ⅓ in lip ⅓ in, obovate-cuneate, stamen arcuate half as long as the lip Habit of a *Kæmpferia* of the *Sincorus* section

IMPERFECTLY KNOWN AND UNDESCRIBED SPECIES

G ? TILIÆFOLIA, *Baker*, annual root-fibres slender fascicled, leafy stem short, leaves 4–5 by 3 in distinctly petioled ovate cuspidate base oblique, spike 4–5 in, terminal, sessile dense fld, bracts 1–1½ in, oblong lanceolate scariose imbricate, corolla tube as long as the bract, segments lanceolate under an inch staminodes not longer than the segments lip oblong-cuneate 1⅓ in —KHASIA HILLS, tropical region, *Hk f & Thomson* (Monolophus 6, *Herb Ind Or*) I have not been able to make out the structure of the anther

G AFFINIS, *Wall mss ex Voigt Hort Suburb Calcutt* 372, *Horan Prodr* 22) —Assam

G JENKINSII, *Wall mss l c*—Assam (See under *G longiflora*)

8 KÆMPFERIA, *Linn*

Stem short or 0 *Leaves* few *Flo* minating a leafy stem *Calyx* sho *Corolla* tube long, slender, segments equal, usually spread staminodes broad, petaloid, stamen short, arcuate, ch is pro duced above int d, usually bifid *Ovary* 3 *Capsule* oblong, pericarp thin *Seeds* subglobose, aril small lacerate —Tropics of the Old World

SUBGEN I **Sincorus,** *Horan* Stemless *Leaves* contemporary with the flowers. *Spikes* central, radical *Lip* usually bifid

* *Anther crest 2 lobed, 2 fid, or toothed*

1 **K. Galanga,** *Linn Sp Pl* 3, *Hort Cliff* t 3, leaves suborbicular subsessile, corolla segments lanceolate, staminodes obovate cuneate white, lip white with a lilac throat deeply bifid anther crest quadrate, lobes two rounded *Rosc in Trans Linn Soc* viii 351, *Scit Pl* t 92, *Roxb in Asiat Res* xi 327, *Hort Beng* 1, *Fl Ind* i 15, *Wall Cat* 6581, *Wight Ic* t 899, *Grah Cat Pl Bomb* 208 *Dalz & Gibs Bomb Fl* 274, *Horan Prodr* 21 K sessilis, *Kœnig in Retz Obs* iii 67 K humilis, *Salisb Prodr* 6 K plantaginifolia, *Salisb in Trans Hort Soc* i 286 Alpinia sessilis *Kœnig in Retz Obs* iii 62 —*Rumph Amboin* v t 69, fig 2 *Rheede Malab* xi t 41

DISTRIB Malay isles

on *Leaves* 3 6 in long spreading flat 10–12 ribbed, margin not thickened

nor ...*owers* 6 12, fugitive, sweet-scented, opening successively, bracts lanceolate green small *Calyx* as long as the bract *Corolla* tube 1 in, segments ½ in, staminodes ½ in long and broad, lip 1 in broad, bifid below the middle, lobes obtuse, anther crest small, with two shallow obtuse lobes

Var K LATIFOLIA, *Donn Hort Cant* ed vi p 3 lip spotted at the throat with brown K Galanga, *Willd, Enum* i 3, *Bot Mag* t 850

2 **K.** ...

sessile

obovat

Horan

BURMA *Carey*, TENASSERIM, *Parish*

Rootfibres oblong *Leaves* spread flat on the ground, 4–6 in long and broad, firmer in texture than in K *Galanga*, tinged red lish brown beneath and with a distinct brown margin *Flowers* few in a sessile central cluster bracts and calyx under 1 in *Corolla* tube 1 in, segments as long white *Staminodes* as long as the corolla segments lip 1 in lobes ½ in broad overlapping anther-crest deeply bifid, lobes bidentate —Nearly allied to *K Galanga* An allied plant with purple flowers sent by Dr King from Quedah in the Malay Peninsula, is probably a distinct species

3 **K. angustifolia,** *Roscoe in Trans Linn Soc* viii 351, *Scit Pl* ... staminodes crest bifid *Rel Lil* t K. undu

...ay isles by 1 in bracts ...s 1 in, ...y ½ in., ...allowly

bifid

4 **K. ovalifolia,** *Roxb Hort Beng* 1, *Fl Ind* i 19, *Corom Pl* t 278, leaves oblong distinctly petioled, spike sessile, corolla segments

large linear, staminodes oblong white, lip lilac deeply cut into two obovate emarginate lobes, anther crest 3-4-dentate, *Rosc Scit Pl* t 95, *Wall. Cat* 6583, *Horan Prodr* 21 K diversifolia, *Link in Dietr Sp Plant* i 57, *Horan Prodr* l c K Parishii, *Hook f in Bot Mag* t. 5763 — Trilophus, *Lestib in Ann Sc Nat* ser ii xv 341.

TENASSERIM, *Parish*, MALACCA, *Farquhar* —DISTRIB Siam

Leaves 6 by 4 in, spr ... wild plant 2–3 in, sor ... produced before the lea ... *Corolla*-tube 1½–2 in long ... lobes of lip short and broad, imbricate, bright lilac, anther crest large, quadrate, usually trifid — Connects the sections *Sincorus* and *Protanthium*, and is included by Horaninov in both, under different names

5 **K. speciosa,** *Baker*, leaves suborbicular erect shortly petioled, flowers in a sessile head large pure white, corolla tube very long, segments ovate, staminodes large obovate, lip patent broader than long bifid

BURMA (*Ic in Hort Calcut*)

Petiole 2–3 in, blade 5–6 in long and broad, plain green or variegated deeper and paler green *Corolla* tube 3 in, segments nearly 1 in, staminodes and lip 1 in, *the expanded limb being 2 in diam*

69, fig 2

7 **K. Prainiana,** *King mss*, leaves oblong lanceolate erect, petiole *as long as the blade, corolla segments oblong ascending, lip oblong-cuneate much longer than the corolla segments*

** *Anther crest entire*

8 **K. Roscoeana,** *Wall in Bot Reg* t 1212 leaves orbicular subsessile variegated black and green, flower entirely white; corolla-segments

short lanceolate, staminodes obovate, lip deeply cut into two obovate lobes, anther crest ovate entire *Hook in Bot Mag* t 5600, *Horan Prodr* 21 K Roscoei, *Wall Cat* 6584

BURMA, *Wallich* (not NEPAL, as stated by Horaninov)

Root-fibres many, fascicled, cylindric *Leaves* 2, spreading flat on the ground, obscurely cuspidate, 4–5 in, firmer in texture than in K *Galanga* margins pale, obscurely crisped *Flowers* few, in a sessile central tuft, bracts and calyx under 1 in *Corolla* tube 1–1½ in, segments ½ in, staminodes ½ in long and nearly as broad, lobes of the lip similar in shape and size, crest of the anther small and not at all lobed —Nearly allied to K *Galanga*

9 **K. parviflora,** *Wall Cat* 6587, leaves subsessile ovate, corolla segments short linear oblong staminodes narrow, lip lilac obovate cuneate emarginate, anther crest orbicular entire

BURMA, banks of the River Attran, *Wallich*

Root fibres slender *Leaves* thin ovate 3–4 in long rounded at the base, plain ... acts 1 in, ... segments ... marginate, ... *strochilus*,

10 **K. involucrata,** *King mss*, leaves oblanceolate oblong long ... surrounded by large oblong green ... minodes rather longer than the ... as long as the corolla segments,

SIKKIM HIMALAYA, *Jaffray* ASSAM, *Jenkins*

Stemless *Petiole* 5–6 in blade 6–7 by 1½–2 in, green, membranous, narrowed gradually to the base *Peduncle* 1–4 in, outer bracts membranous, 1½–2 in, inner small lanceolate *Corolla* tube 1½ in, segments small, oblong, whitish *Staminodes* crested, oblong white, ½ ½ in, lip ½ in long and broad, white with a yellow blotch in the centre

11 **K. Andersoni,** *Baker*, leaves oblong acute shortly petioled ascending, flowers several in a head surrounded by large oblong green bracts staminodes small obovate, lip orbicular emarginate, anther crest orbicular entire

... ttled, narrowed to the base ... than the bracts; segments ... with a yellow spot at the

12 **K. concinna,** *Baker* leaves oblong lanceolate long petioled ascending spikes oblong shortly peduncled, corolla tube rather longer than the bract, flower white blotched with red, lip oblong margins incurved, anther crest small entire

PERAK, alt. 4–600 ft. *King's Collector*

Rootstock very slender *Leaf blade* subcoriaceous glabrous 6–8 by 2 in, petiole slender, 9–12 in *Spikes* many flo... bracts 1 in ovate lanceolate redd... *Calyx* very short *Corolla* tube very slender, gradually dilated to the throat, segments oblong ½ in —Habit of K *pandurata*

Subgen II **Protanthium,** *Horan* Stemless *Leaves* not produced till after the flowers *Spikes* radical *Lip* and *anther crest* bifid

13 **K. rotunda,** *Linn Sp* 3, leaves oblong erect petioled, corolla-
white, lip lilac or reddish
st deeply bifid *Roxb in*
Rosc Scit Pl t 97, *Bot*
h Cat Pl Bomb 208,
m 316 K longa, *Jacq*
Hort Schoenb t 317, *Red Lil* t 49 K versicolor, *Salisb in Trans Hort Soc* i 286 —*Rheede Hort Mal* xi t 9

above and tinged purple beneath *Spikes* 4-6-fld, produced in March and April before the leaves, bracts oblong, acute, outer short, the inner 2 3 in long *Calyx* nearly as long as the corolla-tube, minutely toothed, slit down one side *Corolla-tube* 2 3 in, segments spreading nearly as long as the tube *Staminodes* 1½–2 in, lip rather shorter, reflexed, 2 lobed to below the middle lobes ¾ 1 in broad, deeply tinged with lilac or red purple, anther crest cut half way down into two lanceolate lobes, with often a small tooth between them

14 **K. candida,** *Wall Pl Asiat Rar* i 47, t 56 *Cat* 6585, flowers white, corolla segments lanceolate, staminodes obovate obtuse, lip orbicular cuneate shallowly bifid, anther crest bifid

BURMA, *Wallich* &c, Shan Hills, 3000 ft, *Collett*

Rootstock tuberous, root fibres slender, with large tubers at the end *Leaves* not known *Spikes* 6 8 fld,
Calyx 1 in, minutely toothed
1 in or less, staminodes 1½
and broad, tinged yellow in
rotunda

Subgen III **Monolophus,** *Wall* (gen) *Leafy stem* usually produced *Leaves* contemporary with the flowers *Spikes* terminal on the leafy stem *Lip* bifid or entire *Anther crest* entire

15 **K. siphonantha,** *King mss*, leafy stem none, leaves oblong oblique at the base, petiole longer than the blade, flower lilac, staminodes oblong, lip broad deeply bifid

lanceolate, greenish

16 **K. elegans,** *Wall Cat* 6593, leafy stem short or none, leaves
blade, flowers bright lilac, stami-
the base into two obovate lobes
elegans, *Wall Pl Asiat Rar* i

PEGU, MARTABAN, TAVOY, and TENASSERIM.

Annual, root fibres slender *Leaves* 2-4 to a tuft, 5-6 by 2-3 in, acute, thin, green above, much paler beneath, base rounded; petiole channelled, nearly as long as the blade *Cluster* of flowers shortly peduncled, outer bracts 2 in, oblong-lanceolate, green *Calyx* about 1 in *Corolla* tube slender, twice as long as the

calyx, segments less than 1 in, green, lanceolate, staminodes spreading, ½ in, lip ¾–1 in long and broad, bifid nearly to the base, anther-crest large, suborbicular

17 **K. macrochlamys,** *Baker*, stemless, leaves lanceolate petioled, flowers white, staminodes orbicular-cuneate, lip broad cut deeply into two orbicular lobes

TENASSERIM, *Parish*
Leaves 4-5 l
long *Cluster*
brown *Coroll*
ments, lip 1 in
ovate, entire — Described from a sketch and notes made by Prof Oliver of a plant that flowered in Kew in May, 1871

18 **K. linearis,** *Wall in Roxb Fl Ind ed Wall & Carey*, i 20, leafy

EASTERN HIMALAYA, ASSAM, SILHET and the KHASIA HILLS alt 2 3500 ft
Annual, root fibres slender *Stem* simple, slender erect 4–10 in *Leaves* ascending membranous, green, 3 4 by ¼–½ in *Spikes* 1 2 sessile or shortly peduncled 1–2 fld, outer bract 1–1½ in lanceolate acuminate green *Corolla*-tube 1½–2 in, segments ⅓–½ in, staminodes as long as the corolla segments, lip about ¾ in long and broad, tinged with yellow at the throat, anther crest large, orbicular

19 **K. sikkimensis,** *King mss*, leafy stem elongate, leaves sessile lanceolate acuminate, corolla tube twice as long as the bract, segments linear oblong dark lilac staminodes white orbicular cuneate, lip suborbicular white entire

SIKKIM and BHOTAN HIMALAYA, *King Elwes*
Stems slender, 2–4 in long *Leaves* reaching 2–3 in long ½ 1 in broad *Spike* solitary, 1 flowered, its base hidden in the sheath of the uppermost leaf, bract green ½ in long *Corolla* tube slender, an inch long segments ½ in long — Very near *K linearis*

20 **K. secunda,** *Wall in Roxb Fl Ind ed Wall & Carey*, i 19, leafy stem produced leaves sessile oblong acute flowers white or red, corolla segments linear oblong, staminodes oblong cuneate lip broad cuneate slightly emarginate *Bot Mag* t 6909 Monolophus secundus, *Wall Cat* 6591, *Horan Prodr* 22

SIKKIM HIMALAYA, ASSAM, SILHET, the KHASIA HILLS and TENASSERIM, ascending to 4000 ft
Annual *Leafy stem* 6–9 in slender simple *Leaves* 3–4 by 1 in (or more), membranous, green ascending acuminate *Spikes* 1–4, outer bract 1 1½ in, oblong lanceolate, green, moderately firm *Calyx* much shorter than the bract *Corolla* tube 1½–2 in, segments ½ ½ in greenish membranous, staminodes scarcely longer than the corolla segments, lip 1 in or more broad, anther crest large, ovate

21 **K. parvula,** *King mss* leafy stem produced leaves petioled oblong acute, flowers small white solitary in the axil of a large folded oblong firm green bract

MALAY PENINSULA, Goping, *King's Collector*

Habit of *K secunda* *Leafy stem* 3–4 in , bearing 3–7 distinctly-petioled oblique oblong acute moderately firm glabrous leaves 1–2 in long *Bract* 1 in , terminal, solitary, shortly peduncled *Corolla* tube very slender, much shorter than the bract

Subgen IV **Stachyanthesis,** *Benth* *Leafy stem* produced *Flowers* many in a terminal spike *Lip* bifid, anther crest quadrate entire

H.

CONCAN, on the banks of rivulets *Graham* &c

Rootstock tuberous, oblique, root fibres long slender *Leaves* 12 by 2–3 in,

9 HITCHENIA, *Wall*

Habit and inflorescence

marginal on the broad connective, not crested *Ovary* 3 celled ovules many, superposed style filiform, stigma turbinate *Capsule* oblong trigonous, finally dehiscing *Seeds* ovoid, arillate —All Indian

1 **H. glauca,** *Wall in Trans Med Phys Soc Calcutt* vii 215, bracts all with flowers, corolla-tube twice the length of the bract, segments oblong, staminodes as long as the corolla-segments, lip ovate, filament short. *Horan Prodr* 24 Curcuma glaucophylla, *Wall. Cat* 6594, *Grah Cat Pl Bomb* 210

BURMA, *Wallich*

Rootstock bearing only small tubers at the end of long slender fibres *Stem* 3–4 ft by 4 5 in , narrowed gradually from the ts crowded, orbicular-cuneate, 1–1½ in corolla-tube 2 in , segments small, ob *Staminodes* as long as the corolla segments, lip ovate, not clawed, acute, obscurely emarginate, stamen as long as the corolla-segments

2 **H. caulina,** *Baker*, upper bracts empty and enlarged, corolla-tube half as long again as the bract, segments ovate, staminodes as long as the corolla segments, lip orbicular, filament very short Curcuma caulina, *Grah in Cat Pl Bomb* 210, *Dalz & Gibs Bomb Fl* 275, *Lisboa in Journ Bomb Nat Hist Soc* ii 140, with fig

The CONCAN, abundant on the table land of Mahableshwar

Rootstock ovoid, white inside, bearing large oblong tubers at the end of long

fibres Leafy *stem* 3 4 ft *Leaves* oblong 1-1½ ft by 5 6 in, narrowed to the base, often tinged red brow
spreading in the upper third
corolla tube slender, 1½ in,
lip ½ in diam, deeply bifid,

3 **H. Careyana,** *Benth in Gen Plant* iii 643 bracts all flowering, corolla tube little longer than the bract, segments linear staminodes minute lip cuneate with a long claw, filament long Curcuma Careyana, *Wall Cat* 6505

EASTERN HIMALAYA subtropical region KHASIA HILLS ASSAM CACHAR, SILHET and MANIPUR

Stem 4 ft *Leaves* oblong 1 2 ft by 4 5 in, narrowed gradually from the middle to the base *Spike* 6-8 in; bracts 1-1½ in closely imbricate obovate cuneate, squarrose bracteoles 1 in lanceolate *Flowers* purple, corolla segments
n cuneate with a
apsule small, green,
much in structure

IMPERFECTLY KNOWN SPECIES

Malacca, *Griffith, Maingay*

10 HEDYCHIUM, *Kœnig*

Rootstock horizontal tuberous root fibres not much thickened *Stem* elongate, leafy *Leaves* distichous oblong or lanceolate *Flowers* subsolitary or in terminal spikes bracts oblong subcoriaceous one or more fld *Calyx* tubular, 3 dentate *Corolla* tube long slender segments linear,
... or oblong cuneate filament
produced lip large bifid
yle long filiform stigma
many, small and lacerated

SECT I **Gandasulium,** *Horan* *Stamen* never much longer than the lip

* *Leaves more or less pubescent beneath*

1 **H. coronarium,** *Kœnig in Ret Obs* iii 73 leaves oblong or
ate 3-4 fld
lanceolate
or rather
Ind i 10,
Enum 11,
Jir i 56 Wight Ic t 2010 Wall Cat 6531 in Kew Journ v 1852,
Ibe Fuim 519 H spicatum *Journ Bot* ... not of *H* mill H
Gandasulium Prophet ... and allium *Herb* ... —Hedychium, *Griff*
Ital iii 11 (the 2nd species)—*Rungh* ... ng 3

Throughout India from the HIMALAYAS to CEYLON and MALACCA, ascending to 4000 ft in the Khasia Hills, and 6000 ft in Ceylon —DISTRIB —Malay Islands

Rootstock 1 in thick *Stem* 4–6 ft *Leaves* often above a foot by 3–5 in, usually pubescent beneath *Spike* ½–1 ft, outer bracts 1½–2 by 1 in, at first green, [illegible] *Flowers* fragrant, [illegible] segments linear, [illegible] about ½ in; lip [illegible] unded, filament [illegible] *Seeds* with a crimson aril

Var H CHRYSOLEUCUM *Hook Bot Mag* t 4516 (sp) lip white with a large yellow patch in the centre *Lindl & Paxt Fl Gard* i 110 t 77

Var H MAXIMUM, *Rosc Scit Pl* t 52 (sp), *leafy stem* taller than in the type, flowers pure white larger staminodes ¾–1 in. broad, lip 2–2½ in broad *Lindl in Bot Reg* t 1022 *Horan Prodr* 24

Var H FLAVESCENS, *Carey in Rosc Scit Pl* t 50 (sp) stature of the type, flowers sulphur yellow *Wight Ic* t 2003–9, H flavum, *Bot Mag* t 2378 (not of t 3039) H sulphureum, *Wall mss*

Var H UROPHYLLUM, *Lodd Bot Cat* t 1785 (sp), stature of the type, flowers bright yellow *Horan Prodr* 24

Var H FLAVUM, *Roxb Hort Beng* 1, *Fl Ind* i 12 (sp), dwarfer than the type, flowers smaller bright yellow *Rosc Scit Pl* t 49, *Bot Mag* t 3039, *Lodd Bot Cat* t 604, *Wall Cat* 6542, *Kew Journ Bot* v (1853) 326, *Horan Prodr* 24

2 **H. Elwesii,** *Baker*, leaves oblong nearly glabrous beneath, spike dense fld., bracts large oblong 4–5-fld, calyx shorter than the bract, flowers bright yellow, staminodes lip linear, broad shallowly bifid, stamen as long as the lip

[illegible]

⅓ in —May be an extreme form of *H coronarium*

3 **H. marginatum,** *Clarke in Journ Linn Soc* xxv 75 t 31, leaves oblong lanceolate very hairy beneath, spike short dense fld, bracts oblong imbricated 1-fld, flowers yellow, staminodes linear, lip small cuneate distinctly clawed shallowly bifid, stamen rather longer than the lip

[illegible] without locality [illegible] cts 1½–2 in, not so [illegible] and a tuft of hairs [illegible] lyx, segments 1 in, [illegible] lip 1 in long, claw long, blade ¼–½ in broad

4 **H. venustum,** *Wight Ic* t 2012, leaves oblong-lanceolate nearly [illegible] all 1 fld, flowers [illegible] narrow cuneate [illegible] *Wall in Kew*

NILGHIRI HILLS, *Wight*

Leaves 1 ft. by 3–4 in, obscurely pubescent beneath *Spike* 6–9 in, cirrhous

... Calyx 1½ in. ... as the corolla. ... the middle into

** *Leaves quite glabrous beneath*

5 **H. spicatum,** *Hamilt ex Smith in Rees Cyclop* xvii No 3, leaves oblong or oblong-lanceolate, spike dense fld, bracts large oblong 1-fld, calyx shorter than the bract, flowers white, staminodes lanceolate, lip cuneate deeply bifid, stamen rather shorter than the lip *Rosc Scit Pl.* t 48, *Hook Exot Flora*, t 46, *Bot Mag* t 2300, *Royle Ill* 357, *Wall. Cat* 6553, *in Kew Journ* v (1853), 328, *Horan Prodr* 24

SUBTROPICAL HIMALAYA, NEPAL, *Wallich* KUMAON, alt 5000–7000 ft, *Royle, Strachey & Winterbottom*

Leaves reaching 1 ft or more, very variable in breadth, glabrous *Spike* sometimes 1 ft., bracts oblong, obtuse, green, 1–1½ in by ¾ in broad, flowers ascending and closely imbricate in the type *Corolla*-tube 2–2½ in, segments 1 in, linear, staminodes 1 in, lanceolate, lip ½–¾ in broad, not at all clawed, lobes 2 rounded, filament pale red, anther linear, ⅛–⅙ in *Capsule* glabrous, globose

Var TRILOBUM, *Wall in Kew Journ* v (1853) 328; spike laxer, bracts narrower convolute round the calyx, corolla-segments staminodes and lip longer, the latter with a small tooth between the two lobes H trilobum, *Wall Cat* 6551 —Nepal, *Wallich*

Var ACUMINATUM *Wall in Kew Journ l c*, leaves glabrous beneath, spike laxer and flowers fewer, bracts convolute round the calyx, flowers white or pale yellow, tube, corolla-segments staminodes and clawed lip longer than in the type, stamen about half as long as the lip H acuminatum, *Rosc Scit Pl* t 47, *Bot Mag* t 2969, *Lodd Bot Cat* t 1795 —Kumaon to Sikkim, ascending to 7000 ft

Var KHASIANUM *Clarke*, like the last, but leaves pubescent beneath —Khasia Hills *Clarke*

H flavescens Lodd Bot Cat t 723 (*not of Carey*) and *H Sieboldii*, Wall in Kew Journ v 371 (*H flavescens*, Lindl in Hort Soc Journ vii 281, & Paxt. Flow Gard iii 164, fig 311 *H Roxburghii*, Siebold in Hort Soc Journ l c) are probably varieties of this species

H bicornutum, Wall mss is a monstrous form, with two stamens, each with a large erect spur at the base of the anther

6 **H. densiflorum,** *Wall Cat* 6552, *Kew Journ* (1853) v 368, leaves oblong, spike long moderately dense fld, bracts small oblong 1 fld, calyx longer than the bract, flowers small bright yellow staminodes lanceolate, lip cuneate deeply bifid, stamen as long as the lip *Horan Prodr* 25

TEMPERATE HIMALAYA, NEPAL *Wallich*, SIKKIM, alt 6000–8000 ft. *Griffiths' Collectors*, *J D H*

Leaves 1 ft by 4 5 in glabrous beneath *Spike* sessile, sometimes 1 ft, bracts oblong ½–1 in rolled tightly round the calyx *Calyx* cylindric about 1 in. *Corolla*-tube 1–1½ in, segments linear, reflexing, under 1 in, staminodes lanceolate, under 1 in; lip about ½ in, not clawed, stamen just exceeding the staminodes, filament yellow, anther linear

SECT II **Macrostemium,** *Horan* Stamen much longer than the lip (rather longer in *H Griffithianum*)

* Lip narrow 2 fid or 2 partite, lobes or segments narrow (lip emarginate in *H ellipticum*)

† *Leaves glabrous beneath*

aves oblong-lanceolate subcoriaceous, as long as the bract, flowers bright aminodes lanceolate half as long as g clawed bipartite segments narrow, stamen twice as long as the lip

oroid glabrous, the middle to ... rolled tightly round the calyx *Corolla* tube ¼-in longer than the calyx, segments 1 near convolute 2 in long, staminodes and lip about 1 in, filament bright red, 2 in, anther large, linear

8 **H. longicornutum,** *Griff mss*, leaves oblong lanceolate, spike short dense fld oblong bracts oblong hairy imbricate 1 fld, calyx longer than the bract, corolla segments much longer than the oblanceolate staminodes, lip bipartite, segments narrow, stamen twice as long as the lip

MALACCA, *Griffith, Maingay*

Epiphytic *Stem* slender, 1-1½ ft *Leaves* 1 ft by 2-2½ in thin, narrowed gradually to the base and apex *Spike* 1½-2 in, lower bracts 1 in *Calyx* protruded, ½-¾ in beyond the bract *Corolla* tube protruded ¼ in beyond the calyx, segments bright red, 1½-2 in, staminodes half as long as the corolla-segments lip a little shorter than the staminodes, stamens as long as the corolla-segments, anther linear

9 **H. Gomezianum,** *Wall Cat* 6543, *in Kew Journ* v (1853) 368, ... acts 1 fld cylindric, calyx linear, lip narrow clawed er than the lip *Horan* t species

TAVOY, *Gomez*, TENASSERIM, *Griffith*

Epiphytic, gland dotted *Leafy stem* 1 ft or more *Leaves* sometimes above 1 ft, 2- ... 3-4 in, ... *Spike* cernuous, bract ... ice as long as the stamino ... ar, 1 in white, anther linear, orange yellow, filament 1½ in,

clop xvii No 2, ricate 1 fld, calyx narrow unguicu- *sc Sert Pl* t 55, *Bot Cat* ... 1851, *Wall in Kew Journ* v. (1853) 327, *Horan Prodr* 25 H fastigiatum, *Wall Cat* 6310

TROPICAL HIMALAYA, from GARWHAL, SIKKIM, and KHASIA HILLS, alt 2000-5000 ft

Leaves ½-1 ft. by 3-5 in *Spike* very dense, 3-4 in, bracts bright green about 1 in *Corolla* tube twice as long as the bract, segments 1 in, linear, staminodes rather shorter and broader than the corolla segments, lip oblong, distinctly clawed, shorter than the staminodes, only emarginate at the apex; filament 1½ 2 in, anther linear, orange yellow

11. **H. villosum,** *Wall in Roxb Fl Ind* i 12, *in Kew Journ* v

(1853) 329, *Cat* 6515 A, B, leaves oblong or oblong lanceolate, spike long dense fld, bracts oblong very hairy often 2 3-fld, calyx longer than the bract, flowers white, staminodes linear, lip narrow clawed bipartite segments narrow, stamen twice as long as the lip, anther small sagittate *Rosc Scit Pl* t 54, *Horan Prodr* 25

NEPAL, SILHET, ASSAM, KHASIA HILLS MUNIPUR, alt 4000–6000 ft
Leaves sometimes 1 ft 2–4 in broad, glabrous beneath *Spike* ½ 1 ft, rachis very stout and hairy, bracts pale green, ¾-1 in *Calyx* about 1¼ in *Corolla*-tube longer than the calyx; segments linear 1–1½ in, staminodes like the corolla-segments, lip 1 in or more, filament 1½–2 in, bright red, anther much shorter than in any other species

Var TENUIFLORUM, *Wall Cat* 6516 C, flowers much smaller than in the type, corolla segments staminodes and lip ½ in —Assam, Silhet and Khasia

†† *Leaves more or less pubescent beneath*

12 **H. aureum,** *Clarke & Mann mss*, dwarf, leaves small thin lanceolate, spike short dense fld oblong bracts 1 fld wrapped tightly round the calyx, calyx as long as the bract flowers very small golden yellow, staminodes linear, lip narrow cuneate deeply bifid segments narrow, stamen half as long again as the lip

NORTHERN KHASIA HILLS, alt 5000–6000 ft *Clarke Mann*
Epiphytic, leafy stem short, slender *Leaves* 6–8 by 1 1½ in, slightly pubescent beneath, tapering gradually to a long point *Spike* 1½ 2 in, bracts cylindric, green, glabrous, ½ in *Calyx* about as long as the bract *Corolla* tube ½ ¾ in, segments linear, ⅓–½ in staminodes as long as the corolla-segments lip ½ ½ in long, narrowed gradually to a short claw, filament as long as the lip, anther linear, ⅛ in *Capsule* globose, glabrous, the size of a pea

13 **H. gracile,** *Roxb H rt Beng*, *Fl Ind* i 14, *Cor Pl* iii 48, t 251, leaves oblong lanceolate spike long moderately dense fld, bracts 1 fld wrapped tightly round the calyx, calyx longer than the bract, flowers small greenish white staminodes linear lip oblong cuneate 2 partite, segments narrow stamen half as long again as the lip *Wall Cat* 5516 B *in Kew Journ* v (1853) 367 *in part*

KHASIA HILLS and CHITTAGONG *Roxburgh Wallich*
Leafy stem 2 3 ft *Leaves* 5–6 by 1½–2 in, thin, caudate finely pubescent beneath *Spike* 2–4 in, bracts ½ in green, cylindric thin glabrous *Calyx* a little longer than the bract *Corolla* tube 1 in very slender segments linear nearly as long as the tube, staminodes very narrow shorter than the corolla segments, lip ½ in, distinctly clawed, filament 1 in, bright red, anther linear *Capsule* globose, glabrous the size of a pea

Var H GLAUCUM, *Rosc Scit Pl* t. 53 (sp) More r bu t and larger in all its spike oft nG 9 in, bracts ¾ in parts ype H gracile *Wall Cat* t 16 \ in *Bot Mag* t 6638 — Khasia Hills,

14 **H. Griffithianum,** *Wall in Kew Journ* v (1853) 19 leaves lanceolate, spike lax fld bracts 1 fld cylindric, calyx longer than or equalling the bract flowers white or pale yellow, staminodes linear lip long narrow clawed bipartite segments narrow stamen rather longer than the lip *Horan Prodr* 25

KHASIA HILLS alt 4-5000 ft *Griffith, Hook f & T* ...
Leaves sometimes above 1 ft 2–3 in broad marked above with glandular lines

finely pilose beneath *Spike* 6 9 in , bracts 1–1½ in , rolled tightly round the calyx, ... 3 in , segments 1 in , linear. *Stami-* ... lip 1 in long, filament bright red, ... ose, glabrous, ½ in diam —Nearly

Var *glanduligerum*, Clarke *Leaves* glabrous beneath Whole plant especially the flower very glandular —Khasia Hills

... *Rees Cyclop* xiii No 4, oblong bracts cylindric ... ate staminodes linear, en twice as long as the , *Rosc Scit Pl* t 56, in *Bot Reg* t 767.

H Tocucho, *Herb Hamilt*

Tropical Himalaya, from Kumaon to Sikkim, alt 2 4000 ft, and Chittagong

Leaf sometimes 1 ft, 3–4 in broad, finely pilose beneath *Spike* very dense, 3–6 in , lower empty bracts ovate flower-bracts cylindric green, 1½ in *Corolla tube* not much longer than the bract, segments 1 in , linear staminodes as long as the corolla segments, lip as long, distinctly clawed, usually cut about half way down into two linear-oblong segments, filament whitish, 1½ 2 in , anther linear

** Lip cuneate or obovate

16 **H. Hookeri,** *Clarke mss* , dwarf leaves short oblong spike short oblong bracts oblong imbricate 1-fld , calyx shorter than the bract, flowers very small sulphur yellow, staminodes oblong cuneate, lip obovate-clawed bifid stamen twice as long as the lip

Khasia Hills alt 1–5000 ft, *Hook f & Thomson* Assam *Griffith*

Leafy stem slender 1–1½ ft *Leaves* 5–6 by 2 in thin, glabrous, caudate, base cuneate *Spike* 1–2 in , resembling that of *Globba bulbifera*, few fl , bracts ½ in , ... *orolla* tube a little longer as the corolla-segments, , anther ⅛ in *Capsule*

17. **H. Gardnerianum,** *Rosc Scit Pl* t 62, tall leaves oblong white pulverulent beneath, spike long moderately dense fld , bracts large

Mart Fl Bras iii p 3, t 9

... 1–6000 ft ... it beneath, as are ... racts 1½ 2 in , roll ... ger than the bract, segments greenish, reflexing, 1–1½ in *Staminodes* above 1 in by ⅓–½ in broad, lip 1 in or more, ½–⅔ in broad, narrowed gradually to a short claw , filament bright red, 2–2½ in , anther linear, ¼–½ in *Capsule valves* ovate, orange red within, persistent, ¾ in *Seeds* brownish-crimson

Var *H* pallidum, *Regel in Trans Russ Hort Soc* 1861, t 153 (sp) *Lip* narrower, more distinctly clawed and distinctly bifid. *Horan Prodr* 25 —Khasia, *J D H*

18 **H. speciosum,** *Wall in Roxb Fl Ind Ed Carey & Wall* i 13, *Cat* 6550, *Pl As R* ... moderately yellow, stam ... length of the lip H Gardnerianum, *part* Gamochilus, *Lestid in Ann Sc Nat Ser* 2, xv 341

SILHET, *Gomez*

Leaves above 1 ft, 3–4 in broad, glabrous beneath *Spike* ½ 1 ft, lower bracts 1½ in, ¾ in broad *Calyx* cylindric, about as long as the bract *Corolla-tube* 2 in, segments linear, 1 in, staminodes longer than the segments, lip not clawed, 1 in by ½ in broad, filament bright red, twice as long as the lip, anther linear, yellow, ¼–⅓ in

19 **H. stenopetalum,** *Lodd Bot Cab* t 1902, very tall, leaves oblong very hairy beneath, spike long lax or moderately dense fld, bracts large oblong often 2 fld, flowers pure white staminodes oblanceolate lip oblong cuneate bifid, stamen twice as long as the lip H barbatum, *Wall Cat* 6541. H coccineum β, in part, *Wall in Kew Journ* v (1853), 373 H elatum, *Clarke in Journ Linn Soc* xxv 75 H elatum *var* orgyale, *Horan Prodr* 25

ASSAM, KHASIA, the NAGA HILLS and NORTH BURMA, alt 1500–3000 ft

The tallest species *Leaves* sometimes 2 ft by 5–6 in very hairy all over beneath *Spike* 1 ft or more rachis very stout bracts rigid often 2 in by 1 in *Calyx* shorter than and corolla-tube scarcely longer than the bract *Corolla-segments* linear, 1½ in, staminodes shorter than the corolla segments, lip pure white, 1 in, narrowed gradually into a short claw filament pale, 1¼–2 in, anther linear, yellow, ½ in

*** Lip orbicular

20 **H. coccineum,** *Hamilt ex Smith in Rees Cyclop* xviii. 5, leaves lanceolate, spike long moderately dense fld bracts oblong 1–2 fld calyx not longer than the bract flowers small bright crimson, staminodes lanceolate, lip orbicular distinctly clawed deeply bifid stamen more than twice as long as the lip *Wall in Kew Journ* v (1853), 372, *ex parte*, *Rosc Scit Pl* t 58, *Wall Cat* 6518, *Reichb Ic Exot* t 164, *Royle Ill* 357, *Roxb Fl Ind edit Wall & Carey*, i 82, in note

CENTRAL and EASTERN HIMALAYA common (under one or other form) CEYLON (native?)

Leaves 1 ft or more, 1½ in broad, base rather rounded, narrowed gradually from the middle to the point *Spike* 1 ft, bracts green, 1 1½ in *Corolla* tube scarcely ... under 1 in, ... ar, ¼–⅓ in — ... ll brick red

Var H SQUARROSUM *Buch Hamilt mss* (sp), less robust with smaller bright crimson flowers and very long glabrous leaves often not above 1 in broad H angustifolium, *Wall Cat* 6517, *in Kew Journ* v (1853) 371 in greater part *non Roxb* —Common in the Eastern Himalaya Khasia, and Upper Burma alt 5–6000 ft Ceylon

Var H LONGIFOLIUM *Rosc Scit Pl* t 59 (sp), flowers bright crimson, leaves very narrow pubescent beneath —Same range as the last variety

Var H ANGUSTIFOLIUM *Roxb Hort Beng* 1 ... *Fl Ind* ... 248 t. 251, *Fl Ind*

1 13, leaves not so long and narrow as in the two last spike shorter, flowers dull brick red or salmon red often 3–4 in a fascicle, lip obovate cuneate less deeply bifid under ½ in and broad *Rosc Scit Pl* t 60 *Bot Mag* t 2078, *Lern Hort* t 807 —Chittagong and Silhet always at low levels

Var II CARNEUM, *Rosc Scit Pl* t 57 (sp), leaves 1½–2 in, flowers white tinged with pale red lip orbicular ⅓–¾ in long and broad, filament pale red 1½–2 in *Bot Mag* t 2637, *Lodd Bot Cab* t 693

21 **H. aurantiacum,** *Wall Cat* 6551, leaves long lanceolate, spike long moderately dense fld, bracts oblong often 2–3 fld, calyx not longer than the bract, flowers bright orange yellow, staminodes lanceolate lip orbicular distinctly clawed deeply bifid, stamen more than twice as long as the lip *Rosc Scit Pl* t 39 H Gardnerianum var γ, *Wall in Kew Journ* v (1853), 369, *Savi Fl Ital* iii t 112 H angustifolium, *Bot Reg* t 157

[illegible]

base glabrous beneath *Corolla* tube not much staminod s as long as the broad as long filament stronger with some forms

[illegible]

22 **H.** [illegible] short dense fld, [illegible] rolla tube twice [illegible] bifid distinctly

ASSAM *Oldham*

Intermediate between *H flavum* & *aurantiacum* *Stem* slender *Leaves* under 1 ft Bracts broad green 1 in *Corolla* tube 2 in, segments linear, pale yellow, above 1 in lip under 1 in broad, uniform yellow throughout narrowed suddenly to a short claw —Described from a drawing in the Calcutta collection

23 **H. gratum,** *Wall* ex *Voigt Hort Suburb Calcutt* 570 (name only), leaves long lanceolate spike dense fld bracts large oblong, corolla tube much longer than the bract flowers whitish staminodes oblong lip orbicular clawed deeply emarginate, stamen a little longer than the lip

KHASIA HILLS, *Wallich*

Leafy stem long and stout *Leaves* above 1 ft 3 in broad *Spike* ½ ft, bracts 2–3 in *Corolla segments* linear 1½ in, staminodes 1 in narrowed to the base, lip 1 in broad narrowed suddenly to a short claw —Differs from *coccineum* by its whitish flowers and shorter stamens Described from a drawing in the Calcutta collection

24 **H. elatum,** *Br in Bot Reg* t 526, leaves large oblong, spike long moderately dense fld bracts oblong 1–2 fld moderately large, calyx as long as the bract flower white tinged with red staminodes oblanceolate, lip orbicular clawed bifid, stamen twice as long as the lip *Rosc Scit Pl* t 63 *Wall Cat* 6549 A B, *Lodd Bot Cab* t 846, *Reichb Fl Exot* t 270, *Horan Prodr* 26 H coccineum, var β *Wall in Kew Journ* v (1853), 373, *in part*

SUBTROPICAL HIMALAYA [illegible]

Leaf above 1 ft, 3–4 in [illegible] very stout, bracts oblong 1– [illegible] tube a little longer than the bract, segments linear, [illegible] in; staminodes 1 1½ in,

distinctly clawed; lip rounded at the base to a distinct claw, ¾ 1 in broad, white,

11. AMOMUM, *Linn*

Rootstock perennial, widely creeping *Leafy stem* elongate *Leaves* usually oblong lanceolate *Spikes* dense-fld, except in § *Cenolophus* produced direct from the rootstock, bracts imbricate *Calyx* cylindric, 3-dentate *Corolla* tube cylindric,
often broader and more convex
lip broad or lingulate, filament

and subglobose or
r dehiscing irregu-
lobose or truncate

SECT I. **Geanthus,** *Reinw* (gen) *Spike* radical *Lip* broad *Anther* not crested (Sp 1—4)

1. **A. gramineum,** *Wall Cat* 6558, leaves small thin lanceolate pubescent beneath spike small globose, peduncle very short, outer bracts lanceolate, lip small

TAVOY, *Gomez*
Stem slender, 2–3 ft *Leaves* 6 by 1 in *Spike* 1 in, bracts ½–¾ in *Calyx* ½ in *Corolla*-tube rather longer than the calyx, segments ½ in linear-oblong, lip rather longer than the corolla segments *Anther*-cells short, glabrous

2 **A. floribundum,** *Benth in Gen Plant* iii 644, leaves oblong lanceolate glabrous beneath, spike globose, peduncle long erect, outer bracts large orbicular, lip small obovate Elettaria floribunda *Thw Enum* 319

CEYLON, forests in the Ambagamowa district
Leafy stem 3–6 ft or more *Leaves* subcoriaceous, 18–24 by 3–5 in petioled
Pedunc long and broad,
flowers *Flowers* pale
ochrace shorter than the
tube

3 **A. nemorale,** *Benth in Gen Plant* iii 644 leaves oblong-lanceolate glabrous beneath, spike small globose, peduncle very short, outer bracts ovate obtuse, lip small orbicular 3 lobed Elettaria nemoralis, *Thw Enum* 319

CEYLON, forests in the Reigam and Pasd on Corles
Rootstock slender *Leafy st* 2 4 ft *Leaves* hrm 6–15 by 1½ 2 in *Spike* 1–1½ in, peduncle decumbent shorter than the spike bracts glabrous, outer ½ ¾ in, inner lanceolate *Corolla* tube under 1 in, segments short, oblong obtuse *Lip* yellow, copiously veined with purple, midlobe smaller, bifid *Capsule* globose ½ in, shortly beaked

4 **A. involucratum,** *Benth in Gen Plant* iii 644 leaves large oblong lanceolate glabrous beneath spike globose peduncle long erect, outer bracts very large obovate overtopping the flowers lip small obovate equally 3 lobed. Elettaria involucrata *Thw Enum* 319

i 13, leaves not so long and narrow as in the two last spike shorter, flowers dull brick red or salmon red often 3-4 in a fascicle lip obovate cuneate less deeply bifid under ½ in and broad *Rosc Scit Pl* t 60 *Bot Mag* t 2078, *Kern Hort* t 807 —Chittagong and Silhet always at low levels

Var H CARNEUM, *Rosc Scit Pl* t 57 (sp), leaves 1½ 2 in flowers white tinged with pale red lip orbicular ½ ¾ in long and broad, filament pale red 1½-2 in *Bot Mag* t 2637, *Lodd Bot Cab* t 693

21 **H. aurantiacum,** *Wall Cat* 6551, leaves long lanceolate, spike long moderately dense fld, bracts oblong often 2-3 fld, calyx not longer than the bract, flowers bright orange yellow, staminodes lanceolate, lip orbicular distinctly clawed deeply bifid stamen more than twice as long as the lip *Rosc Scit Pl* t 39 H Gardnerianum *var γ, Wall in Kew Journ* v (1853), 369, *Savi Fl Ital* iii t 112 H angustifolium, *Bot Reg* t 157

KUMAON and NEPAL, alt 5000 ft or more

Leaves 1-1½ ft by 2-3 in narrowed gradually to the base glabrous beneath *Spike* ½ 1 ft, bracts oblong, green glabrous, 1-1¼ in *Corolla* tube not much

22 **H. luteum,** *Herb Calcut*, leaves oblong lanceolate, spike short dense fld, bracts oblong closely imbricate, flowers lemon yellow, corolla tube twice as long as the bract, staminodes lanceolate, lip orbicular bifid distinctly clawed, stamen half as long again as the lip

ASSAM, *Oldham*

Intermediate between *H flavum* & *aurantiacum* *Stem* slender *Leaves* under 1 ft Bracts broad green 1 in *Corolla* tube 2 in, segments linear, pale yellow, above 1 in lip under 1 in broad, uniform yellow throughout narrowed suddenly to a short claw —Described from a drawing in the Calcutta collection

23 **H. gratum,** *Wall* ex *Voigt Hort Suburb Calcutt* 570 (name only), leaves long lanceolate spike dense fld bracts large oblong corolla tube much longer than the bract flowers whitish staminodes oblong, lip orbicular clawed deeply emarginate, stamen a little longer than the lip

KHASIA HILLS, *Wallich*

Leafy stem long and stout *Leaves* above 1 ft 3 in broad *Spike* ½ ft, bracts 2-3 in *Corolla segments* linear 1½ in, staminodes 1 in narrowed to the base, lip 1 in broad narrowed suddenly to a short claw —Differs from *coccineum* by its whitish flowers and shorter stamens Described from a drawing in the Calcutta collection

24 **H. elatum,** *Br in Bot Reg* t 526, leaves large oblong, spike long moderately dense fld bracts oblong 1-2 fld, moderately large, calyx as long as the bract flower white tinged with red staminodes oblanceolate, lip orbicular clawed bifid stamen twice as long as the lip *Rosc Scit Pl* t 63, *Wall Cat* 6549 A B, *Lodd Bot Cab* t 850, *Reichb Fl Exot* t 270, *Horan Prodr* 26 H coccineum, *var β, Wall in Kew Journ* v (1853), 373, *in part*

S

L

very

tube

l, white, anther d from several of Wallich's numbers.

11. AMOMUM, *Linn*

Rootstock perennial, widely creeping *Leafy stem* elongate *Leaves* usually oblong lanceolate *Spikes* dense fld, except in § *Cenolophus* produced direct from the rootstock, bracts imbricate *Calyx* cylindric, 3 dentate. *Corolla* tube cylindric, segments oblong or linear-oblong, upper often broader and more convex *Lateral staminodes* 0 or minute teeth lip broad or lingulate, filament short, arcuate, anther cells divaricate sometimes hairy, often furnished with a petaloid crest *Ovary* 3 celled ovules many, superposed, style filiform, stigma small and subglobose or larger and gibbous on the back *Fruit* indehiscent or dehiscing irregularly, sometimes beaked, winged or echinate *Seeds* globose or truncate Species about 150, in the tropics of the Old World

SECT. I **Geanthus,** *Reinw* (gen) *Spike* radical *Lip* broad. *Anther* not crested (Sp 1—4)

1. **A. gramineum,** *Wall Cat* 6558, leaves small thin lanceolate pubescent beneath, spike small globose, peduncle very short, outer bracts lanceolate, lip small

TAVOY, *Gomez*

Stem slender, 2–3 ft *Leaves* 6 by 1 in *Spike* 1 in.; bracts ½–¾ in. *Calyx* ½ in *Corolla*-tube rather longer than the calyx, segments ¼ in. lip oblong; lip rather longer than the corolla segments *Anther*-cells short,

2 **A. floribundum,** *Benth in Gen Plant* iii 644, leaves oblong-

Leafy stem 3–6 ft

Peduncle 1 1½ ft, brac

flowers very numerous,

ochraceous yellow *Cor*

tube. *Fruit* small, oblong, smooth

3 **A. nemorale,** *Benth in Gen Plant* iii 644, leaves oblong-lanceolate glabrous beneath, spike small globose, peduncle very short, outer bracts ovate obtuse, lip small orbicular 3 lobed Elettaria nemoralis, *Thw Enum* 319

CEYLON, forests in the Reigam and Pasdoon Corles

Root f ck slender *Leafy stem* 2 4 ft *Leaves* firm 6 15 by 1½–2 in *Spike* 1½ in, peduncle decumbent, shorter than the spike, bracts glabrous, outer inner lanceolate *Corolla* tube under 1 in, segments short, oblong, obtuse yellow, *Lip* smaller, *Capsule* globose, ½ in. shortly beaked.

4 **A. involucratum,** *Benth in Gen Plant* iii 644, leaves large oblong lanceolate glabrous beneath spike globose, peduncle short, erect, outer bracts very large obovate overtopping the flowers, lip small obovate equally 3 lobed. Elettaria involucrata, *Thw Enum*

1 13; leaves not so long and narrow as in the two last spike shorter, flowers dull brick red or salmon red often 3–4 in a fascicle lip obovate cuneate less deeply bifid under ½ and broad *Rosc Scit Pl* t 60 *Bot Mag* t 2078, *Kern Hort* t 807 —Chittagong and Silhet always at low levels

Var II CARNEUM *Rosc Scit Pl* t 57 (sp) leaves 1½–2 in flowers white tinged with pale red lip orbicular ⅓–¾ in long and broad filament pale red 1½–2 in *Bot Mag* t 2637 *Lodd Bot Cab* t 693

21 ... leaves long lanceolate, spike long ... 2–3 fld, calyx not longer than ... staminodes lanceolate lip ... as ... ... of

Reg t 157

KUMAON and NEPAL alt 5000 ft or more

...

of *coccineum* than with *Gardnerianum*

22 **H. luteum,** ... short dense fld, ... corolla tube twice ... bifid distinctly ...

ASSAM *Oldham*

Intermediate between *H flavum* & *aurantiacum* *Stem* slender *Leaves* under 1 ft Bracts broad green 1 in *Corolla* tube 2 in segments 1 near pale yellow above 1 in lip under 1 in broad un form yellow throughout narrowed suddenly to a short claw —Described from a drawing in the Calcutta collection

23 **H. gratum,** *Wall* ex *Voigt Hort Sub rb Calcutt* 570 (name

KHASIA HILLS, *Wallich*

Leafy stem long and stout *Leaves* above 1 ft 3 in broad *Spike* ½ ft bracts 2–3 in *Corolla segments* 1 near 1½ in staminodes 1 in narrowed to the base; lip 1 in broad narrowed suddenly to a short claw —Differs from *coccineum* by its whitish flowers and shorter stamens Described from a drawing in the Calcutta collection

24 **H. elatum,** *Br* in *Lod Reg* t 596 leaves large oblong ... bracts oblong 1 2 fld. moderately large, white tinged with red staminodes ob... stamen twice as long as the lip ... 6 19 ... *Hall Lot Cab* t 8... *rodr* 20 H coccineum var β *Wall*

SUBTROPICAL HIMALAYA, ...

Leaf above 1 ft 3 in ... very stout bracts oblong 1 ... tube a little longer than the ...

bra
l ne
vel
lare, oblong trigonous

19 **A. scyphiferum,** *Kœnig in Retz Obs* iii 68, leaves oblong-lanceolate pubescent beneath, spike oblong shortly peduncled, outer bracts large suborbicular rigid reticulated, lip as long as the corolla segments Hornstedtia Scyphus, *Ret Obs* vi 18 Stenochasma urceolare, *Griff Notul* iii 431, *Ic Plant Asiat* t 358

MALACCA *Kœnig Griffith Maingay (Kew Distrib* 1582) SINGAPORE *Ridley*
Leafy stem 10–12 ft *Leaves* 1½–3 ft by 4–6 in *Spike* 4 in 2 in diam central bracts 2 in rigid tip rounded, vertical ribs raised and connected by tomentose cross veinlets *Corolla*-tube 2 in, segments shorter linear-oblong *Lip* bright red concave to the tip, base auriculate *Anther* cells pilose, crest orbicular-oblong *Capsule* 1 in, oblong trigonous

20 **A. triorgyale,** *Baker* leaves oblong lanceolate pubescent beneath, spike oblong subsessile outer bracts large suborbicular not reticulated, lip as long as the corolla segments

PERAK, *King s Collector*
Nearly allied to *A scyphiferum* *Leafy stem* 20 ft *Leaves* above 2 ft by 6 in, distinctly petioled *Spike* like that of *A scyphiferum* but the bracts less rigid and the close vertical ribs not connected by raised pubescent cross veinlets *Corolla*-tube 2 in, segments and lip shorter than the tube

Sect IV **Euamomum,** *Benth* *Spike* radical *Lip* broad *Anther* crested

* Anther crest entire or crenate

† *Anther crest lunate*

21 **A. Kœnigii,** *Baker* leaves oblong spike ovate oblong shortly peduncled outer bracts obtuse, lip 3 lobed bifid longer than the corolla segments anther crest semilunar Amomum, No 57 *Kœnig in Ret. Obs* iii 51 Meistera *Giseke Præl Linn* 205

Coast of TENASSERIM island of Junk Seylan *Kœnig*
Leafy stem 6–7 ft Outer *bracts* cilate cymbiform, as long as the corolla tube *Corolla* segments obovate subequal white *Lip* white broader than the corolla-segments, central lobe small, anther crest white —I have seen no specimen

22 **A. acuminatum,** *Thw Enum* 317 leaves oblong lanceolate caudate glabrous beneath, spike globose shortly peduncled bracts small oblong acute, lip broad 3 lobed longer than the corolla segments, anther-crest semilunar

CEYLON *Palampoora at a low elevation*
Rootstock wide creeping *Leafy stem* 2–4 ft *Leaves* 5–6 by 1½ in shortly petioled *Spike* 1 1½ in bracts under 1 in *Lip* yellow tinged with red, central lobe emarginate, anther-cells ciliate, crest crenulate

23 **A. fulviceps,** *Thw Enum* 317 leaves oblong lanceolate glabrous beneath spike globose peduncle moderately long bracts oblong pubescent, lip 3 lobed not longer than the corolla segments anther crest semilunar

33 **A. hypoleucum,** *Thw Enum* 318, leaves large oblong-lanceolate silvery beneath, spike 1–3 fld, peduncle very short, bracts oblong membranous, lip broad longer than the corolla segments, anther-crest subquadrate crenate, capsule 9-ribbed.

CEYLON, damp forests of the central province, up to 1000 ft
Rootstock slender *Leafy stem* stout, 4–5 ft *Leaves* 1½ 2 ft by 3–5 in, persistently silky beneath, petiole 3 in *Spikes* many to a rootstock, bracts 1¼ 2 in. *Corolla*-tube as long as the bracts, segments 1 in, oblong white, subequal, lip orbicular cuneate, 1⅓ in, entire, white with a yellow disk tinged with red *Capsule* 1 in globose, red

[illegible] *Plant* in 641, leaves oblong- [illegible] sessile, outer bracts oblong- [illegible] corolla segments, anther-crest [illegible] lettaria cannæcarpa, *Wight Ic* [illegible]

NILGHIRI HILLS; *Wight, Gardner*
Leafy stem 4 6 ft *Leaf* 12 by 2½ in *Spike* 3 in, outer bracts 1–1½ in, tips deep pink, paler below *Corolla* tube 1½ in, segments oblong half as long, the upper broader, lip obovate, yellow, emarginate; filament short, anther-cells parallel, glabrous, crest very small, entire *Capsule* rigid, 1 in diam *Seeds* angled — Wight's description and figure do not agree with one another, and neither is quite accurate

35 **A. subulatum,** *Roxb Cor Pl* t 277, *Fl Ind* i 44, leaves oblong lanceolate glabrous beneath, spike globose shortly peduncled, outer bracts obtuse with a horny cusp, lip obovate cuneate emarginate, anther-crest small truncate, capsule echinate *Horan Prodr* 29

EASTERN HIMALAYAS, *Roxburgh*
Leafy stem 3 4 ft *Leaves* 1–2 ft by 3–4 in green, glabrous on both surfaces *Spike* very dense, shortly peduncled, 2–3 in, bracts red brown, outer 1 in, ovate, inner shorter and obtuse *Calyx* and corolla-tube 1 in, segments obtuse, shorter than the tube, upper cuspidate *Lip* yellowish white, rather longer than the corolla-segments *Filament* very short, anther-crest entire. *Capsule* 1 in, globose, red brown, densely echinate

** Anther crest 3–4-lobed

† *Spike 2–3 fld*

36 **A. biflorum,** *Jack in Mal Misc* i 2, leaves oblong-lanceolate glabrous except the midrib, spike 2 fld peduncled, bracts lanceolate, lip obovate white with a yellow centre, anther-crest 3 lobed *Hook Bot Misc.* i 274

PENANG, *Jack*
Rootstock not thicker than a goose quill. *Leafy stem* 3 ft *Peduncle* enveloped in bracteal sheaths; bracts reddish; bracteole half as long as the calyx. *Corolla* white, segments subequal *Lip* white, tip rounded —Not seen

37 **A. elatterioides,** *Baker*, leaves oblong-lanceolate softly pubescent beneath, spike sessile 2 fld, bracts lanceolate, corolla tube long slender, lip broad longer than the corolla-segments, anther-crest 3-lobed — Amomum sp. *Griff Notul* iii 417.

MALACCA, *Griffith, Kew Distrib* 5753, *Mangay* (K d 1573)
Rootstock slender *Leafy stem* 2 2½ ft. *Leaves* 9–12 by 1½–2 in *Spikes* many

to a rootstock; bracts 1 in, reddish, membranous *Corolla* tube 2 in, very slender, segments ½ in, linear oblong, membranous *Lip* white subcochleate, twice as long as the corolla segments with a broad yellow central band with a reddish border, anther crest large, petaloid

†† *Spike many fld, oblong*

38 **A. Kingii,** *Baker*, leaves oblong lanceolate spike oblong peduncled, bracts ovate lip small broad emarginate, anther crest obscurely 3 lobed, fruit neither costate nor echinate

SIKKIM HIMALAYA, *King*

Leafy stem stout *Leaves* above a foot long, 3–4 in broad *Spike* 4–5 in, bracts pale brown, 1–1½ in, peduncle as long as the spike *Corolla* tube 1 in, segments oblong, obtuse nearly as long as the tube *Lip* ½ in broad, white tinged with yellow, obscurely 3 lobed, narrowed suddenly to a broad claw, stamen shorter than the lip *Capsule* globose, 1 in diam

39 **A. uliginosum,** *Kœnig in Retz Obs* III 56, leaves oblong glabrous, spike peduncled, outer bracts oblong lip broad emarginate margins rounded ascending anther crest 4 lobed capsule globose echinate *Wurfbainia*, *Giseke Præl Linn* 206

MALAY PENINSULA, Raput Nok *Kœnig*

Rootstock filiform *Leafy stem* 3–4 ft *Leaves* scarcely 1 ft. *Spike* distant from the leaves bracts oblong membranous subrigid white *Corolla* segments white, upper oblong, obtuse lateral lanceolate *Lip* with a rigid claw and a recurvato-ascending cymbiform blade —*Descript from Kœnig, l c*

††† *Spike globose*

40 **A. xanthophlebium,** *Baker*, leaves lanceolate glabrous, spike globose shortly peduncled, outer bracts large oblong glabrous, lip broad 3 lobed longer than the corolla segments, anther crest trifid

MALACCA *Maingay* (*Kew Distrib* 1585)

Leafy stem long robust *Leaves* above 1 ft *Spikes* 2–2½ in and broad, peduncle about as long, outer bracts reddish 1½ in *Corolla* tube as long as the bract; lower segments oblong, upper broader ovate *Lip* dull red paler towards the margin, with radiating yellow veins *Anther*-crest broad, lateral lobes decurved

41 **A. aromaticum,** *Roxb Fl I* [illegible]
glabrous beneath, spike globose shortly [illegible]
lip large obovate cuneate, anther crest [illegible]
echinate *Wall Cat* 6559, *Horan* [illegible] fasciculata,
Rosc Scit Pl t 109 Geocallis fasciculata *Horan Prodr* 33

EASTERN HIMALAYAS tropical region NEPAL *Wallich*, SIKKIM, KHASIA HILLS, SILHET & NORTHERN BENGAL, *Roxburgh* &c

Leafy stem 3–4 ft *Leaves* 1–1 ft. by 2–4 in, and glabrous on both sides [illegible]

42 **A. pterocarpum,** *Thw Enum* 317 leaves large oblong lanceolate glabrous beneath, spike globose shortly peduncled, outer bracts

oblong glabrous, lip short broad, anther crest short 3 lobed, capsule ovoid 9 ribbed

to t
elor
with red *Capsule* 1 in, ribs crenulate

43 **A. Benthamianum,** *Trimen Cat Ceyl Pl* 92, leaves lanceolate glabrous beneath spike small globose shortly peduncled, bracts oblong acute glabrous, lip short broad, anther crest broad 3 lobed, capsule small echinate

CEYLON, Reigam Corle, *Thwaites*
Rootstock slender *Leafy stem* short and slender *Leaves* 6–8 by 1–1½ in, shortly petioled *Spike* 1 in diam outer bracts green sb 1 in, peduncle rather longer than the spike *Corolla* tube 1 in segments oblong obtuse *Anther*-crest with 3 shallow orbicular lobes *Capsule* ½ in diam

44 **A. aculeatum,** *Roxb in Asiat Res* xi 344, t 6, *Fl Ind* i 40, leaves oblong lanceolate glabrous beneath, spike globose shortly peduncled, outer bracts ovate lip broad rather longer than the corolla segments, anther crest broad 3 lobed, capsule echinate, *Horan Prodr* 30

SOUTH ANDAMAN ISLANDS *Kurz* —DISTRIB Malay isles
Rootstock tuberous. *Leafy stem* 5–10 ft *Leaves* sessile 1 1½ ft by 2–4 in *Spike* 2 in diam., bracts brown, acute, 1–1½ in *Corolla* tube 1 in, segments oblong half as long as the tube *Lip* suborbicular, pale yellow, tinged with red in the centre. *Anther* crest short broad, equally 3 lobed *Capsule* brown, rigid, densely echinate 1 in under

45 **A. echinatum,** *Willd Sp Plant* i 8, leaves lanceolate glabrous

30

CEYLON, forests of central province up to 4000 ft
Leafy stem 6 12 ft *Leaves* 1 2 ft by 2 3 in, caudate or acuminate, sessile *Spike* 1½ 2 in diam peduncle stout ½ ft bright red in the lower part, its bract leaves very obtuse and imbricate, bracts 1 in, faintly pubescent, brown black, convex *Corolla* tube 1 in; segments oblong, obtuse *Lip* yellow, with many fine red veins *Anther* crest short and broad, with three subequal orbicular lobes *Capsule* 1 in, purplish-black, with copious curved spines

SUBGEN V **Cenolophon,** *Horan* (gen.) *Spike* terminal on the leafy stem (Sect 46–48)

46 **A. rufescens,** *Benth in Gen Plant* iii 645, leaves oblong-lanceolate, spike dense and globose, lip broad 3 lobed as long as the corolla-segments Elettaria rufescens, *Thw Enum* 430

CEYLON; Ambagomowa district, alt 3000 ft
Leafy stem 1½–2 ft *Leaves* ¾ 1 ft. by 1–2 in moderately firm, green and glabrous on both surfaces *Spike* small, globose terminal, enveloped at first in a large green orbicular cuspidate bract; flower bracts obtuse, under 1 in *Corolla* segments oblong, obtuse; lip as long as the corolla segments, midlobe retuse.

47 **A. vitellinum,** *Lindl in Journ Hort Soc* ii 245, *Bot Reg*

1847, t 52, leaves oblong, spike dense fld. globose lip orbicular twice as long as the corolla segments Conolophon vitellinum, *Horan Prodr* 36

CEYLON? Hort Chiswick

Leafy stem slender, 2 ft *Leaves* 6–8 by 3 4 in, bright green, glabrous *Spike* small, shortly peduncled, bracts green oblong, ½ in *Calyx* and corolla tube about as long as the bract, corolla segments linear-oblong, as long as the tube *Lip* 1 in, base spurred, bright yellow, with red veins *Anthers* with a large trifid crest, cells glabrous, tips diverging

48 **A. macrostephanum,** *Baker*, leaves lanceolate base cordate, spike elongate, bracts deciduous, lip obovate cuneate much longer than the corolla segments

PERAK, alt 500–1000 ft, *King's Collector*

Leafy stem very slender, 4–8 ft *Leaves* 1–1½ ft by 2–3 in thin, glabrous, caudate, narrowed from the middle to the cordate base *Spike* 3–4 in, peduncle long, erect, enveloped in the sheath of the topmost leaf, bracts caducous *Ovary* densely villous *Calyx* loosely tubular, ½ in *Corolla* tube rather longer than the calyx, segments linear oblong *Lip* 1 in *Filament* half as long, anther glabrous, crest large, leafy, crisped, lacerate

12 ZINGIBER, *Adans*

Rootstock horizontal, tub ... ng- lanceolate, clasping the st ... lly radical, rarely lateral or t ... ort or long, bracts persistent ... 3- ... Lateral ... anther ... 3 celled, ... globose ... –Species 30, Tropics of Old World

Sect I **Cryptanthium,** *Horan* *Spikes produced direct from the rootstock, very short and dense*, peduncle very short —(Sp 1–11)

* *Leaves more or less pubescent beneath*

1 **Z. chrysanthum,** *Rosc Scit Pl* t 86, leaves pubescent beneath, bracts green outer ovate inner lanceolate with a hairy cusp, corolla segments bright red, lip bright yellow deeply 3 lobed midlobe orbicular, lateral ovate *Horan Prodr* 27 Z ligulatum, *Wall Cat* 6566, non *Roxb*

TROPICAL HIMALAYA, from KUMAON, ascending to 5500 ft, to SIKKIM a l ASSAM

Leafy stem 6–8 ft *Leaves* 12 by 2–3 in, oblong-lanceolate *Spike very dense* globose or oblong, peduncle very short, inner bracts 1½–2 in broad *Corolla* tu ... potted; basal aur ... la ... *tamen* shorter than t ... lip ... wrapped to the top ... a ... Sp ... 54, is probably a form of this, but the description is very incomplete

2 **Z. rubens,** *Roxb* in *Asiat Res* xi 348, *Hort Beng* 1, ... t. 53, leaves pubescent beneath, bracts bright red outer ...

lanceolate, corolla segments red, lip oblong much spotted and streaked with red on a pale ground, basal auricles small rounded. *Rosc Scit* t. 88, *Horan Prodr* 28

KHASIA HILLS, *H f & T* (*Herb Ind Or* 10), *Clarke* BENGAL, Rungpore, *Hamilton*

Leafy stem stout, 6–8 ft *Leaves* 12 by 4–5 in or more *Spike* very dense, globose, peduncle 1–4 in, inner bracts 1½ in *Corolla* tube as long as the bracts, segments 1 in, lanceolate subequal bright red *Lip* nearly as long as the corolla-segments, yellowish white copiously spotted and streaked with minute dots and lines of red purple *Stamen* as long as the lip, beak of the anther bright red

3 **Z. roseum,** *Rosc in Trans Linn Soc* viii 348, *Scit Pl* t 87, leaves pubescent beneath, bracts pale red outer ovate inner lanceolate, corolla-segments pale red lip oblong cuneate whitish unspotted, basal auricles very small yellow rounded *Roxb in Asiat Res* xi, 347, *Fl Ind* i 50, *Wall Cat* 6570, *Horan Prodr* 28 Amomum roseum, *Roxb Coromand Pl* t 126

NORTHERN CIRCARS *Roxburgh*

Leafy stem 3–4 ft *Leaves* 8–12 by 3–4 in *Spike* very dense, oblong; peduncle very short, inner bracts 1½–2 in *Corolla* tube whitish 2 in, segments 1 in, lanceolate, subequal *Lip* shorter than the corolla-segments, margins recurved, crisped *Stamens* arching over the lip and equalling it in length, beak as long as the anther, as in the other species

4 **Z. Nimmonii,** *Dalz in Hook Kew Journ Bot* iv (1852) 341, leaves [illegible] oblong or lanceolate, corolla [illegible]rginate, basal auricles small [illegible]ran *Prodr* 28 Alpinia Nim-[illegible]

CONCANS common in the mountains *Nimmo Dalzell*

Leaf stem 4–5 ft *Leaves* 1–1½ ft 6–12 by 2–3 in broad *Spikes* subglobose, peduncle very short, bracts glabrous 1 1½ in *Corolla* tube as long as the bracts, segments lanceolate *Lip* obovate cuneate faintly emarginate *Capsule* the size of a pigeon's egg —Nearly allied to *Z panduratum*

5 **Z. Wightianum,** *Thw Enum* 315, leaves pubescent beneath, bracts green outer ovate inner lanceolate, corolla segments pale, lip obovate cuneate pale yellow veined and spotted with purple, basal auricles small ovate Z squatrosum, *Wight Ic* t 2004 non *Roxb*

TRAVANCORE, abundant in the Anamallay forests &c CEYLON; common in the forests up to 4000 ft

Leafy stem 4 [illegible] or subglobose, [illegible] as long as the [illegible] corolla segments [illegible] the other species [illegible] in a specimen from Thwaites the spike is terminal on the leafy stem, thus connecting sections *Cryptanthium* and *Dymczewiczia*

6. **Z. barbatum,** *Wall Pl Asiat Rar* t. 55, *Cat* 6567, leaves pubescent beneath, bracts reddish green ovate cuspidate, corolla segments whitish, lip obovate cuneate white emarginate, basal auricles very small *Horan Prodr* 28

BURMA, *Wallich* PEGU, *McClelland*

Leafy stem 2–3 ft. *Leaves* oblong, 6–8 by 1½ 2 in *Spike* 1½–2 in very dense, ovoid, peduncle very short; bracts 1 in., ovate with a large green cusp, hairy all

over. *Corolla*-tube ¾–1 in., upper segment larger than the two side ones, concave. *Lip* ½ in. *Stamen* as long as the lip.

7. **Z. squarrosum,** *Roxb. in Asiat. Res.* xi. 348; *Hort. Beng.* 1; *Fl. Ind.* i. 54; leaves pubescent beneath, bracts green lanceolate tips hooked, corolla segments pink lip ovate emarginate yellowish white tipped with lilac basal auricles small spreading rounded. *Wall. Cat.* 6568; *Horan. Prodr.* 28.

BURMA, *Roxburgh*; Prome, *Wallich*. PEGU, *F. Carey*.

Leafy stem 2–3 ft. *Leaves* 12 by 3–4 in. *Spike* globose, very dense; peduncle very short; outer bracts short, ovate; inner about 1 in., pale green, tip distinctly hooked. *Corolla*-tube 1 in.; segments lanceolate, subequal, about as long as the tube. *Lip* shorter than the corolla-segments, distinctly emarginate, margins deflexed. *Stamen* nearly as long as the lip.

** *Leaves glabrous beneath.*

8. **Z. ligulatum,** *Roxb. in Asiat. Res.* xi. 348; *Hort. Beng.* 1; *Fl. Ind.* i. 51; *Coromand. Pl.* t. 253; leaves glabrous beneath, bracts pink outer ovate inner lanceolate, corolla segments pink, lip obovate cuneate yellowish white unspotted, basal auricles small ovate. *Horan. Prodr.* 28.

COROMANDEL, *Roxburgh*.

Leafy stem about 2 ft. *Leaves* 12 by 2–3 in., oblong lanceolate. *Spike* dense, subglobose, peduncle 2–3 in.; bracts about 1 in. *Corolla* tube as long as the
[illegible] nts, margin crisped,
[illegible] men yellow, shorter
[illegible] le. *Seeds* blackish.

9. **Z. cornuum,** *Dalz. in Hook.* [illegible]
glabrous beneath, bracts yellowish [illegible]
segments buff yellow, lip deeply bifid [illegible]
cles small red and yellow. *Dalz. & G*[illegible]

CONCAN; at Ram Ghat, *Dalzell*.

Leafy stem curved, bright light green. *Leaves* oblong lanceolate, acuminate. *Spikes* ovoid, peduncle very short. *Lip* beautifully coloured. *Capsule* smooth, yellowish-white. *Seeds* red, striated, aril membranous.

10. **Z. panduratum,** *Roxb. Hort. Beng.* 2; *Fl. Ind.* i. 55; leaves glabrous beneath, bracts red outer ovate inner lanceolate, corolla segments bright red, lip obovate yellowish-white unspotted, basal auricles small rounded. *Wall. Cat.* 6569; *Horan. Prodr.* 28.

PEGU, *F. Carey*. TAVOY, *Gomez*.

Leafy stem 3 ft. *Leaves* 6–12 by 3–4 in., ligule very large. *Spike* 2 in., very dense, oblong, peduncle very short, inner bracts 1½ in., tip not hooked. *Corolla*-tube 1½ in.; segments 1 in., subequal. *Lip* shorter than the corolla segments, unspotted, not emarginate. *Stamen* as long as the lip.—Nearly allied to *Z. roseum* & *ligulatum*.

11. **Z. pardocheilum,** *Wall. ex Voigt Hort. Suburb. Calcut.* 562 (name only); leaves glabrous beneath, bracts obovate cuneate red brown truncate, corolla segments reddish, lip deeply 3-lobed tesselated with dark lilac on a yellowish white ground.

BURMA, *Wallich*.

Leafy stem stout. *Leaves* 12 by 3–4 in., oblong lanceolate, acute. *Spikes* 2–3 in.

bracts much imbricate, outer 1 in.
vate lanceolate, a little shorter than
segments, midlobe obovate cuneate,

SECT II **Lampuzium,** *Horan* *Spikes* produced from the rootstock on more or less elongated peduncles with sheathing scariose bract-leaves —Species 12–21

* *Leaves glabrous beneath*

12 **Z. intermedium,** *Baker*, spikes globose, bracts lanceolate, corolla segments pale red, lip orbicular reddish black finely spotted, basal auricles oblong

North KHASIA HILLS at Bhorlasa alt 3500 ft, *Clarke*

bracts rather longer than in Clarke's plant

13 **Z. officinale,** *Rosc in Trans Linn Soc* viii 348, *Scit Pl* t 83,

Horan Prodr 27, *Bentl & Trim Med Pl* t 270 Z Missionis, *Wall Cat* 6565 Amomum Zingiber, *Linn Sp* 1 *Jacq Hort Vind* i t 75 Curcuma longifolia *Wall Cat* 6612 *in part* —*Rheede Hort Mal* xi 21, t 12, *Rumph Amboin* v t 66 fig 1

Widely cultivated in TROPICAL ASIA, native locality unknown

Rootstock biennial, bearing many sessile tubers *Leafy stem* 3–4 ft *Leaves* 3 by 1 in diam, peduncle subequal, under an inch ark purple, as long as the *oxburgh*

14 **Z. Griffithii,** *Baker*, leaves oblong glabrous beneath spikes cylindric shortly peduncled, bracts ovate obtuse bright red, lip yellowish-white 3-lobed.

(K d 1564) 4-6 in, 1 in diam, peduncle *Corolla* tube as long as the

1, 1, leaves oblong lanceolate glab bracts ovate acute red, flowers yell *Horan Prodr 27*, *Hook Bot Mis*

PENANG *Jack*

Leaves 6-7 in, bright green *Scape* a foot. *Corolla* segments longer than the lip —No authentic specimens of Jack's plant exist but King's 7 [illegible] and 10278 from Perak, and Hullet's 654 from Mount Ophir are probably the same species They

have a spike 6-9 in, 1 in diam, peduncle about as long, leafy stem 2-3 ft, and a pink capsule.

16. **Z. Zerumbet,** *Smith Exot. Bot.* ii. 105, t. 112; leaves oblong-lanceolate glabrous beneath, spike oblong very dense, bracts orbicular green, corolla segments whitish, lip sulphur yellow unspotted, midlobe orbicular emarginate, basal lobes large orbicular. *Rosc. in Trans. Linn. Soc.* viii. 348; *Scit. Pl.* t. 84; *Roxb. in Asiat. Res.* xi. 346; *Hort. Beng.* 1; *Fl. Ind.* i. 48; *Horan. Prodr.* 27; *Grah. Cat. Pl. Bomb.* 207; *Bot. Mag.* t. 2000; *Wall. Cat.* 6562; *Wight Ic.* t. 2003; *Dalz. & Gibs. Bomb. Fl.* 272. Z. spurium, *Kœnig in Retz. Obs.* iii. 60. Zingiber sp. *Griff. Notul.* iii. 412; *Ic.* t. 351. Amomum Zerumbet, *Linn. Sp.* i. 1; *Jacq. Hort. Vind.* iii. t. 54. A. spurium, *Gmel. Syst.* i. 6. A. sylvestre, *Poir. Ency. Suppl.* v. 548. Zerumbet Zingiber, *Lestib. in Ann. Sc. Nat.* ser. 2, xx. 329.—*Rheede Hort. Mal.* xi. 27, t. 13; *Rumph. Amboin.* v. 148, t. 64, fig. 1.

From the HIMALAYAS to CEYLON and the MALAY PENINSULA.—DISTRIB. Widely cultivated in tropics of Old World.

Rootstock tuberous, biennial, pale yellow inside. *Leafy stem* 3-4 ft. *Leaves* 12 by 2-3 in. *Spikes* 3-4 in, 1½ in diam; peduncle ½-1 ft; bracts 1-1½ in long and broad, very obtuse, green with a paler edge. *Corolla*-tube as long as the bract; segments 1 in, upper broader. *Lip* with a midlobe ¾ in broad. *Stamen* pale, as long as the lip. *Capsule* oblong, above 1 in.—I cannot from the description distinguish *Z. americans*, Blume, Miq. Fl. Ind. Bat. iii. 593.

** *Leaves more or less pubescent beneath.*

17. **Z. cylindricum,** *Moon Cat. Ceyl. Pl.* 1; leaves oblong-lanceolate pubescent beneath, spikes oblong cylindric, bracts ovate pale or reddish, corolla segments green, lip yellowish-white unspotted obovate, basal auricles small obtuse. *Thwaites Enum.* 315.

[illegible]

Hills of the CONCAN, *Graham*, &c.

Stems reddish, pubescent. *Leaves* dark green, 12-18 by 1½-3 in. *Spike* ½-1 ft, 1½ in diam; peduncle elongate, with large obtuse sheathing scariose bract-leaves; bracts 1-1½ in. *Corolla* tube as long as the bract; segments lanceolate, nearly 1 in. *Capsule* red, pubescent, the size and shape of a sparrow's egg.

19. **Z. spectabile,** *Griff. Notul.* iii. 413; leaves oblong-lanceolate pubescent beneath, spike dense oblong cylindric, bracts orbicular sub-coriaceous reddish with a pale margin, corolla-segments yellowish white, lip orbicular blackish purple, basal auricles short obtuse.

MALACCA, *Griffith* (*Kew Distrib.* 5762); *Maingay* (*K. d.* 1567). PERAK; Larut, *King's Collector*.

Leafy stem long and stout. *Leaves* 9-12 by 2-3 in. *Spike* ½-1 ft, 2½ in diam; bracts 1-1½ in long and broad, more coriaceous and more spreading than in the

other species, resembling those of Hitchenia glauca, peduncle sometimes 1 ft. *Corolla* tube $1\frac{1}{2}$ in ; upper segment broader than the two others *Lip* emarginate *Stamen* nearly as long as the lip *Capsule* oblong *Seeds* shining, black, and 3–5 partite, large, white.

20 **Z. Casumunar,** *Roxb in Asiat. Res* xi 347, t 5, *Hort Beng* 2, *Fl Ind* i 49, leaves oblong lanceolate pubescent beneath, spikes oblong,

Amboin v 154, tab 65, fig 2

From the HIMALAYAS to CEYLON and MALAY PENINSULA —DISTRIB Widely cultivated only in tropical Asia

Rootstock perennial bright yellow inside *Leafy stem* 4–6 ft *Leaves* 12 18 by 2–3 in *Spike* oblong, 4 6 in, 1–2 in diam, peduncle 3–12 in, bracts $1\text{-}1\frac{1}{2}$ in and nearly as broad bright red or greenish red *Corolla* tube as long as … th an orbicular … horter than the … includes three

21 **Z. Parishii,** *Hook f in Bot Mag* t 6019, leaves oblong-lanceolate pubescent beneath, spikes oblong bracts orbicular usually cuspidate pale green with a red edge, corolla segments yellowish-white, lip obovate sulphur yellow marked with brown spots and lines, basal auricles short obtuse

TENASSERIM *Griffith, Parish*

Leafy stem 3 ft *Leaves* 4–6 by 1 $1\frac{1}{2}$ in, thin, bright green *Spike* 2–4 in, $1\frac{1}{2}$ in diam, peduncle 3 4 … densely imbricate, about 1 in … 1 in *Lip* shorter than the … broad, truncate *Stamen* p… anther

SECT III **Pleuranthesis,** Benth *Spike* peduncled arising from the side of the leafy stem (Sp 22)

22 **Z. Clarkei,** *King, mss ex Benth Gen Plant* iii. 646

SIKKIM HIMALAYA; alt 3000–5000 ft, *Hook f Thoms* (*Herb Ind Or* 3), *Clarke King*

… n, finely … peduncle … *Corolla* … *Lip* as … *Stamen* … , shorter

SECT IV **Dymczewiczia,** *Horan* (gen) *Spikes* terminal on the leafy stem (Sp 23, 24)

23 **Z. capitatum,** *Roxb in Asiat Res* xi 318, *Fl Ind* i 55, leaves

linear ascending, bracts ovate. *Rosc Scit Pl* t 90, *Wall. Cat* 6560 Dymczewiezia capitata, *Horan Prodr* 26

CENTRAL and EASTERN HIMALAYAS, from KUMAON to SIKKIM the KHASIA HILLS & SILHET

Leafy stem 3-4 ft. *Leaves* 12 18 by 1-1½ in, tapering gradually to the point, erecto-portent, usually pubescent beneath *Spike* sessile at the end of the leafy stem, dense fld, erect, oblong or oblong-cylindrical, 3-6 in, 1½ 2 in diam, bracts closely imbricate, subcoriaceous, 1½ in, green with a narrow brown edge *Corolla-tube* as long as the bract, segments 1 in pale yellow *Lip* pale yellow, unspotted, midlobe orbicular emarginate ¾ in broad, basal auricles large, oblong, obtuse bright red *Capsule* bright red, the size of a small olive, valves ovate *Seeds* black, shining, aril large lacerated white

Var Z ELATUM, *Roxb Fl Ind* i 57 (sp) A more tropical form, with taller stems, stouter spikes and larger flowers *Rosc Scit Pl* t 91 Dymczewiezia elata, *Horan Prodr* 26

24 **Z. marginatum,** *Roxb in Asiat Res* xi 349, *Fl Ind* i 57? leaves oblong lanceolate spreading, bracts oblong obtuse Dymczewiezia marginata, *Horan Prodr* 26?

KHASIA HILLS, Umwai, alt 3000 ft, *Clarke*

Leafy stem 3-4 ft *Leaves* 4-6 by 1 in, ligule, very large lanceolate, brown *Spike* terminal, sessile, 1 2 in, under ½ in diam, rachis very hairy, bracts ½ in,

IMPERFECTLY KNOWN SPECIES

22 Z. (
several fee
in long 2
1½ in, brac
Prain 59.

23 Z (Ampuzium) near COROLLINUM *Hance in Journ Bot* 1880, 301 Leafy stem long, leaves 10 12 by 1½-2 in lanceolate glabrous spike dense fld a foot long 3 in diam, bracts 1½ 2 in subcoriaceous oblong obtuse glabrous bracteoles 1 in, complicate, flower not seen —Great Cocos island, Andaman group, *Prain* 713

13 COSTUS, *Linn*

Rootstock tuberous, horizontal *Leafy stem* long *Leaves* oblong, sheaths broad *Spike* dense fld, globose or ovoid, usually terminal, rarely produced direct from the rootstock on a short peduncle *Calyx-tube* short, infundibular, teeth ovate *Corolla* tube not longer than the

hemispheres

1 **C. speciosus,** *Smith in Trans Linn Soc* i 249, spike ovoid or oblong terminal on the leafy stem *Roxb in Asiat Res* xi 349, *Hort*

MALAY PENINSULA, Perak, *Scortechini* 1947

Leaves usually solit[illegible]
the base, petiole much [illegible]
ceolate *Calyx* 1 in [illegible]
top, segments ¾ in *L*[illegible]

2 **E. Curtisii,** *Baker*, spike decumbent, corolla-segments linear-oblong, tube very long

PENANG, West hill, alt 2500 ft, *Curtis* 1578

Rootstock sheathed with imbricated obtuse scale leaves *Leaves* solitary, erect, petiole ½ ft, blade 8–9 by 2 in, oblong-lanceolate, coriaceous *Spike* 1½–2 in, rachis very slender, bracts lanceolate, ½ in *Calyx* ½ in *Corolla*-tube ½ in, very slender, segments ½ in *Lip* deflexed, twice as long as the corolla segments

3 **E. serpentina,** *Baker*, spike decumbent secund, corolla segments linear oblong, tube twice as long as the calyx limb

PENANG, alt 1000–1500 ft., *King's Collector*

Rhizome very slender, sheathed by oblong imbricated scale leaves *Leaves* less than 12 in by 2 in, geminate, erect lanceolate, subcoriaceous, glabrous, petiole slender, 8–9 in *Spike* 2–3 in, shortly peduncled, bracts small, lanceolate, membranous *Calyx*-tube ½ in *Corolla* tube 1 in, segments half as long as the tube *Lip* white, marked with red-brown and yellow in the centre

17 SCAPHOCHLAMYS, *Baker*

Rootstock wide creeping, not tuberous *Stem* 0 *Leaves* erect, oblong lanceolate, petiole as long as the blade *Spike* lax-fld, bracts several fld, large, lingulate, persistent *Calyx* oblique, spathaceous *Corolla* tube slender, cylindric, longer than the calyx, lip obovate-cuneate, emarginate, filament short, anther cells slightly divergent, [illegible]

S. malaccana, *Baker*

MALACCA, Mount Ophir, *Cuming*, *Griffith* (*K d* 5761), *Maingay* (*Kew Distrib.* 1579), *Hullett*

Leaf blade firm, glabrous, 6–8 by 2–3 in *Spike* of about 6 nodes, peduncle short, slender, bracts 1 1½ in, green lingulate, erecto patent, obtuse, involute in the lower half *Calyx* ½ in *Flowers* white *Corolla* tube under 1 in, slender, cylindric, segments shorter than the tube *Lip* under 1 in *Stamen* porrect, shorter than the lip *Capsule* ½ in, 3-seeded

18 ALPINIA, *Linn*

Rootstock horizontal *Leafy stem* elongated *Leaves* oblong or lanceolate *Panicle* or *raceme* terminal (except in sp 16–17), bracteoles sometimes enveloping the bud *Calyx* laxly tubular, shortly 3 toothed. *Corolla* tube cylindric, usually not longer than the calyx, segments linear-oblong or oblong, upper usually broader and more convex *Lateral staminodes* 0 or very small, lip patent, often orbicular with incurved margins, sometimes with 2 subulate processes at the base of the claw, filament flattened, anther cells divergent at the apex, furnished rarely with an orbicular crest. *Ovary* 3 celled, ovules few or many in a cell, style filiform, stigma subglobose *Fruit* globose, dry or fleshy, usually

indehiscent *Seeds* globose or angled by pressure —Species 30, in the Tropics of the Old World

Sect. I **Ethanium,** *Horan* *Anther* not crested *Bud* not enclosed in large bracteoles *Panicle* terminal —(Sp 1-9)

1 **A. conchigera,** *Griff Notul* iii 424, *Ic Plant Asiat* t 354, ... ath panicle long narrow, flowers ... lip orbicular yellowish with red ... the base A Galanga, *Wall Cat* ... *e inedit*

CHITTAGONG and the Malay Peninsula to MALACCA —DISTRIB Siam, Cambodia

Leafy stem 3-4 ft *Leaves* ½-1 ft by 2 3 in *Panicle* 6-9 in , rachis pubescent, lower branch often elongate the others short ascending bracts small, brown, scariose, ovate *Calyx* ⅛-⅙ in , mouth oblique, obscurely 3 dentate *Corolla* tube scarcely longer than the calyx, segments ⅛ in *Lip* with incurved margins, not longer than the corolla segments not clawed *Ovules* 2 in each cell —I do not regard *Strobidia* as generically distinct from *Alpinia*

2 **A. Manii,** *King MSS* (under *Strobidia*) leaves oblong lanceolate glabrous beneath, panicle long narrow subracemose, flowers small, corolla segments oblong, lip narrow cuneate

ANDAMAN ISLANDS *King's Collector*

... petioled 12 in or more by 3-4 in , bright ... allies *Panicle* 6-9 in , rachis pubes... ... 1 fl , bracts minute, *Calyx* ⅛ in , long as the calyx, segments ⅛ in *Lip* ... *Capsule* globose, ¼ in diam , 1-2 seeded

3 **A. Galanga,** *Sw Obs Bot* 8 leaves oblong lanceolate glabrous beneath panicle copiously compound, flowers small, corolla segments linear oblong greenish white lip obovate clawed emarginate white veined with lilac with a pair of subulate glands at the base of the claw *Roxb Hort Beng* 2, *Asiat Res* xi 302, *Fl Ind* i 59 *Rosc in Trans Linn Soc* viii 315 *Wall Cat* 6572 ex parte *Grah Cat Pl Bomb* 206, *Dalz & Gibs Bomb Fl* 274 *Thw Enum* 319 A viridiflora *Griff Notul* iii 423 *Ic Pl Asiat* t 353 Maranta Galanga *Linn Sp Plant* 2 Galanga, *Salisb in Trans Hort Soc* i 281 —*Rumph Amboin* v t 63

Throughout INDIA from the foot of the Himalayas to CEYLON and MALACCA.—DISTRIB Malay islands and widely cultivated

Rootstock perennial tuberous slightly aromatic *Leafy stem* 6-7 ft *Leaves* 1 2 ft by 4-6 in green and glossy on both sides *Panicle* dense fl , ½-1 ft., rachis ...

... in Bot Mag t 6341 are forms The drawing of *Costus arabicus*, Linn. in Hermann's Ceylon Herbarium belongs here

4 **A. Allughas,** *Rosc in Trans Linn Soc* viii 346, *Scit Pl* t 67, leaves oblong lanceolate glabrous beneath, panicle narrow copiously com-

MALAY PENINSULA, Perak, *Scortechini*, 1947

Leaves usually solitary, erect, blade oblong lanceolate, 2½–3 ft, narrowed to the base, petiole much shorter *Spike* 6 in, lower internodes ¼ in, bracts lanceolate *Calyx* 1 in *Corolla* tube 2½ 3 in, cylindric, rather dilated towards the top, segments ¾ in *Lip* 1 in, yellow, with two red streaks

2 **E. Curtisii**, *Baker*, spike decumbent, corolla segments linear-oblong, tube very long

PENANG, West hill, alt. 2500 ft, *Curtis* 1578

Rootstock sheathed with imbricated obtuse scale leaves *Leaves* solitary, erect, petiole ½ ft; blade 8–9 by 2 in oblong lanceolate coriaceous *Spike* 1½–2 in, rachis very slender bracts lanceolate ¼ in *Calyx* ¼ in *Corolla* tube ¾ in, very slender, segments ⅓ in *Lip* deflexed, twice as long as the corolla segments

3 **E. serpentina**, *Baker*, spike decumbent secund, corolla segments linear oblong, tube twice as long as the calyx limb

PENANG alt 1000–1500 ft *King's Collector*

Rhizome very slender sheathed by oblong imbricated scale leaves *Leaves* less than 12 in by 2 in geminate erect lanceolate, subcoriaceous, glabrous, petiole slender, 8–9 in *Spike* 2–3 in shortly peduncled, bracts small, lanceolate, membranous *Calyx*-tube ½ in *Corolla* tube 1 in, segments half as long as the tube *Lip* white, marked with red brown and yellow in the centre.

17 SCAPHOCHLAMYS, *Baker*

Rootstock wide creeping not tuberous *Stem* 0 *Leaves* erect, oblong lanceolate, petiole as long as the blade *Spike* lax fld, bracts several fld large, lingulate, persistent *Calyx* oblique, spathaceous *Corolla* tube slender cylindric, longer than the calyx, lip obovate-cuneate, emarginate, filament short, anther cells slightly divergent, with a small petaloid crest *Ovary* 3 celled? ovules few in a cell, style filiform, stigma small, globose *Capsule* subglobose membranous *Seeds* ovoid, with a large white aril cut down to the base into subulate processes

S. malaccana, *Baker*

MALACCA; Mount Ophir, *Cuming*, *Griffith* (*K d* 5761), *Maingay* (*Kew Distrib* 1579) *Hullett*

Leaf blade firm, glabrous, 6–8 by 2 3 in *Spike* of about 6 nodes, peduncle short slender, bracts 1 1¼ in green lingulate, erecto patent, obtuse involute in the lower half *Calyx* ½ in *Flowers* white *Corolla* tube under 1 in, slender, cylindric, segments shorter than the tube *Lip* under 1 in *Stamen* porrect, shorter than the lip *Capsule* ¼ in, 3 seeded

18 ALPINIA, *Linn*

Rootstock horizontal *Leafy stem* elongated *Leaves* oblong or lanceolate *Panicle* or *raceme* terminal (except in sp 16–17), bracteoles sometimes enveloping the bud *Calyx* laxly tubular, shortly 3 toothed *Corolla* tube cylindr [illegible] segments linear-oblong or oblong, [illegible] onvex Lateral *staminodes* 0 or ver [illegible] ar with incurved margins, sometimes [illegible] ase of the claw, filament flattened, [illegible] furnished rarely with an orbicular crest *Ovary* [illegible] celled, ovules few or many in a cell, style filiform, stigma subglobose *Fruit* globose, dry or fleshy, usually

indehiscent. *Seeds* globose or angled by pressure —Species 30, in the Tropics of the Old World

Sect. I. **Ethanium,** *Horan* *Anther* not crested *Bud* not enclosed in large bracteoles *Panicle* terminal —(Sp 1–9)

1 **A. conchigera,** *Griff Notul* iii 424, *Ic Plant Asiat* t 354, leaves oblong lanceolate glabrous beneath, panicle long narrow, flowers small, corolla segments oblong greenish lip orbicular yellowish with red lines and dots with two small teeth at the base A Galanga, *Wall Cat* 6572 E, F Strobidia conchigera, *Kuntze inedit*

CHITTAGONG and the Malay Peninsula to MALACCA —DISTRIB Siam, Cambodia

Leafy stem 3–4 ft *Leaves* ½–1 ft by 2–3 in *Panicle* 6–9 in, rachis pubescent, lower branch often elongate the others short ascending, bracts small, brown, scariose, ovate *Calyx* ⅓–½ in, mouth oblique, obscurely 3 dentate *Corolla*-tube scarcely longer than the calyx, segments ⅛ in *Lip* with incurved margins, not longer than the corolla segments not clawed *Ovules* 2 in each cell —I do not regard *Strobidia* as generically distinct from *Alpinia*

2 **A. Manii,** *King MSS* (under *Strobidia*), leaves oblong lanceolate glabrous beneath, panicle long narrow subracemose, flowers small, corolla-segments oblong, lip narrow cuneate

[illegible]

–4 in, bright rachis pubescent, branches short, erecto [illegible], bracts minute, *Calyx* ⅛ in, minutely 3-dentate *Corolla*-tube twice as long as the calyx, segments ⅛ in *Lip* scarcely longer than the corolla segments *Capsule* globose, ¼ in diam, 1–2 seeded

3 A G[illegible]

benea[illegible] linear [illegible] with [illegible] *Hort* *Soc* [illegible] *& Gil* [illegible]

423, *Ic Pl Asiat* t 363 Maranta Galanga, *Linn Sp Plant* 2 Galanga, *Salisb in Trans Hort Soc* i 281 —*Rumph Amboin* v t 63

[illegible] to CEYLON and MALACCA.—

Leafy stem 6–7 ft. *Leaves* 1–2 [illegible] *Panicle* dense fld, ½–1 ft, rachis densely pubescent branches numerous short, pedicels ⅛–⅙ in, bracts small, ovate, *Calyx* greenish white, ¼ in oblique at the throat *Corolla* segments ⅓–½ in *Lip* distinctly clawed, ½ in basal glands ascending, reddish, linear subulate *Stamen* [illegible]

4 **A. Allughas,** *Rosc in Trans Linn Soc* viii 346, *Scit Pl* t 67, leaves oblong lanceolate glabrous beneath, panicle narrow copiously com-

Rootstock perennial *Leafy stem* 6–10 ft *Leaves* 2–3 ft, oblong-lanceolate, pubescent beneath *Raceme* erect ½–1 ft, rachis very stout, densely pubescent; pedicels all very short *Buds* oblong, obtuse, bracteoles oblong navicular, 1 in *Corolla* segments white, oblong 1 in *Lip* ovate, emarginate, 1½–2 in, margin pale centre beautifully variegated red and yellow, edges much incurved *Capsule* globose, yellow, 1 in diam *Seeds* many, ovoid

12 **A. nutans,** *Rosc in Trans Linn Soc* viii 346, *Scit* t 73, panicle cernuous slightly compound, bracts deciduous, peduncles short, bracteoles white tipped with pink *Smith Exot Bot* ii t 106, *Roxb in Asiat Res* xi 354, *Hort Beng* 2, *Fl Ind* i 65 *Bot Mag* t 1903, *Wall Cat* 6574 ex parte, *Grah Cat Pl Bomb* 206, *Wight Ic* t 2027, *Thw Enum* 320 A malaccensis, *Wall Cat* 6573 B C A cristata, *Griff Notul* iii 421 Globba nutans, *Linn Mant* 170, *Red Lil* t 60 Renealmia nutans, *Andr Bot Rep* t 360, *Salisb in Trans Hort Soc* i 279 Zerumbet speciosum, *Jacq Fragm* t 68, *Wendl Sert Han* t 19

EASTERN HIMALAYAS and MALAY PENINSULA —DISTRIB Malay islands

Rootstock perennial *Leafy stem* 8–10 ft *Leaves* 1–2 ft by 3–6 in, oblong-lanceolate, finely pubescent beneath *Panicle* ½–1 ft rachis very hairy, lower

a cell

VAR ASERICEA, *Moon Cat Ceyl* 1 (sp) panicle shorter, flowers smaller, bracteoles and corolla segments not tipped with pink —Ceylon

13 **A. involucrata,** *Griff Notul* iii 422 panicle cernuous slightly compound, bracts persistent cupular, bracteoles white

MALACCA *Griffith (Kew Distrib 5697), Maingay (K d 1574)* PERAK, *King's Collector*

Nearly allied to *A nutans* of which it may be only a variety *Leafy stem* 10–15 ft Lower branches of the *panicle* elongated with 2–3 flowers crowded at the lip, enveloped by persistent scariose bracts *Capsule* globose 1 in diam

SECT III **Hellenia,** *Willd* *Anther* furnished with a small petioled crest *Panicle* terminal (sp 14–17)

14 **A. aquatica,** *Rosc in Trans Linn Soc* viii 346, leaves oblong not scabrous anther with a semi orbicular crest lip obcordate Hellenia aquatica, *Horan Prodr* 35 Heritiera aquatica *Retz Obs* v 18 Languas aquaticum vel sylvestre, *Kœnig in Retz Obs* iii 65

The DECCAN PENINSULA, in swamps *Kœnig*

Leafy stem 4 ft and more *Leaves* coriaceous, bright green, denticulate,

from Kœnig's description

15 **A. scabra,** *Benth in Gen Plant* iii 648, leaves lanceolate very scabrous above, anther with an obscure truncate crest, lip narrow bilobed Hellenia scabra, *Blume Enum* i 60, *Miq Fl Ind Bat* iii 603, *Horan Prodr* 35

Subgen IV. **Geostachys,** *Baker* *Anther* not crested ... in large bracteoles *Spike* radical

16 **A.? decurvata,** *Baker*, leaves lanceolate, racemes ...

PERAK, Larut, alt 3–4000 ft, *King's Collector*

Leafy stem 4–5 ft *Leaves* 12 15 by 1–1¼ in, narrowed to a petiole ... *Racemes* 6 in, lax, decurved, peduncle short, slender, erect, ... bracteoles 1½ ... rtly pedun... ng as the ca... olla segme...

17. **A.? secunda,** *Baker*, leaves oblong lanceolate, racemes ...

light yellow. *Fruit* deep red

19 RHYNCHANTHUS, *Hook f*

Rootstock tuberous, fibres stout, hairy *Stem* leafy *Leaves* ... lanceolate *Spike* termir... tube long, subcylindric, ... *staminodes* obsolete, lip ... incurved, tip filiform, ... 3 celled ovules many, superposed, style uniform, stigma small, turb... *Capsule* and *seeds* not seen

R. longiflorus, *Hook f in Bot Mag* t 6861

BURMA (*Hort Low*)

Rootstock ovoid, green, 1–1½ in diam *Leafy stem* 1½–2 ft *Leaves* 6–8 by 1½–2 in *Spike* 4–6 in, sessile at the end of the stem, bracts 2 to each flower linear, green, 1–1½ in, wrapped round the calyx tube. *Corolla* tube 1½–2 in, segments 1 in *Stamen* as long as the corolla-tube

20 CLINOGYNE, *Salisb*

Rootstock tuberous or sublignose *Stems* leafy, copiously dichotomously branched *Leaves* oblong or oblong lanceolate *Panicle* lax fl... terminal, flowers in pairs, bracts long, narrow, firm. *Sepals* short, free *Petals* narrow, connivent. *Staminal tube* cylindric, segments obovate, petaloid, unequal, anther 1-celled, adnate to the margin of one segment *Ovary* 3 celled, cells 1-ovuled; style adnate below to the staminal tube, above free, hooked, stigma capitate *Fruit* indehiscent,

1–3 seeded *Seeds* subglobose, aril lacerate, embryo curved.—Species 7–8, tropics of Old World

1 **C. dichotoma,** *Salisb in Trans Hort Soc* i 276, leaves broadly

ramosissima, *Wall Cat* 6615 *Pl Asiat Rar* t 286, *Grah Cat Pl Bomb* 212 Donax Arundinastrum, *Lour Fl Coch* 15 Thalia canniæformis, *Willd Sp Plant* i 16 —*Rumph Amboin* iv 22, t 7

EASTERN BENGAL and the MALAY PENINSULA —DISTRIB Malay islds

Shrub 15 ft, stem short, woolly branches slender Upper *leaves* ovate-oblong 3–6 in by 1⅓–2 in Branches of *panicle* at most 3–4 in, outer bracts lanceolate, 1½ in *Flowers* white, 1 in *Sepals* lanceolate *Petals* oblanceolate, spreading in the upper half *Staminal tube* as long as the largest lobes, lip flat. *Fruit* ½ in diam

2 **C. grandis,** *Benth in Gen Plant* iii 651 leaves broadly rounded at the base branches of the panicle many and moderately long, staminal tube elongated, fruit globose smooth 1 seeded Maranta grandis, *Miq Fl Ind Bat Suppl* 616 Phrynium dichotomum *Korn in Mem Mosc* xi t 89, *Horan Prodr* 11, in part, not *Roxb*

TENASSERIM, MALACCA, PERAK, SINGAPORE and the ANDAMAN ISLDS — DISTRIB Malay islds

Habit of *C dichotoma* Upper *leaves* ½–1 ft by 3–6 in Branches of the *panicle* sometimes 6 9 in, outer bracts 1½ in *Flowers* as in *C dichotoma* *Fruit* glossy, ⅓–½ in diam

3 **C. virgata,** *Benth in Gen Plant* iii 651, leaves slightly rounded at the base, branches of the panicle many and long staminal tube short, fruit 2–3 lobed 2–3 seeded, Maranta virgata *Wall Cat* 6616, *Wight Ic* t 2015, *Thw Enum* 320 Phrynium virgatum, *Roxb in Asiat Res* xi 324, *Hort Beng* 1, *Fl Ind* i 4

The DECCAN PENINSULA and CEYLON

Stems 6–8 ft Upper *leaves* 4–6 by 1–1½ in, lower 1–1½ ft *Panicle* 1 ft or more branches very slender flexuose, outer bracts about 1 in *Flowers* white, inodorous, much smaller than in *C dichotoma* *Fruit* the size of a large pea

21 PHRYNIUM, *Willd*

Rootstock creeping *Leaves* large, oblong, radical, petiole long, sheathing *Spike* compound produced from the side of the petiole or direct from the rootstock, main bracts 2–∞ fld *Sepals* 3, narrow *Corolla* tube cylindric, segments 3, linear oblong, subequal, spreading *Staminal tube* longer than the corolla tube, segments unequal petaloid, one bearing the 1 celled anther on its margin *Ovary* 3-celled, cells 1-ovuled, rarely 2 cells empty; style adnate in the lower part to the staminal tube, free portion hooked, stigma capitate *Fruit* globose, indehiscent or finally dehiscent *Seeds* 1–3 erect, aril short, fleshy, embryo curved —Species 20, tropics of Old World

1 **P. capitatum,** *Willd Sp Plant* i 17, spike globose from the

side of the petiole rarely terminal, main bracts oblong with an incurved scarious tip which breaks up into bristles, corolla segments longer than the tube, fruit usually 3-seeded *Roxb in Asiat Res* xi 325, t 1, *Hort Beng* 1, *Fl Ind* i 8, *Wall Cat* 6619, *Wight Ic* t 2016, *Thw Enum.* 320 Phyllodes Placentaria, *Lour Fl Cochin*, ch 17 Maranta Placentaria, *A Dietr Sp* i 30 —*Rheede Hort Mal* xi t 34

EASTERN HIMALAYAS, MALAY PENINSULA, MALABAR, TRAVANCORE, CEYLON DISTRIB Malay islds

Rootstock perennial tuberous *Leaves* oblong 1 1½ ft by 6 8 in, petiole longer than the blade that which bears the spike 2–3 ft or more *Spike* sessile 1½–2 in diam, subtended by 2–3 large rigid ovate bracts, inner main bracts 1 by ½ in, firm, oblong, several fld *Sepals* large, linear *Corolla*-segments linear-oblong purple. *Capsule* turbinate, 3 lobed, the size of a gooseberry, smooth, 3 valved

2 **P. parviflorum,** *Roxb Hort Beng* 1, *Fl Ind* i 7, spike globose from the side of the petiole, bracts lanceolate, corolla-segments white shorter than the tube, fruit usually 1-seeded *Rosc Scit Pl* t 34, *Wall. Cat* 6620, *Horan Prodr* 11 Maranta parviflora, *A Dietr. Sp.* i. 30

EASTERN HIMALAYAS and MALAY PENINSULA, and the CONCAN

Rootstock tuberous, perennial *Leaves* oblong cuspidate, 1–1½ ft by 6–8 in, petiole longer than the blade, the one that bears the spike 2–2½ ft *Spike* sessile, 1–2 in diam, bracts 1 in, pale green, acute 2–3 fld *Corolla* tube as long as the bract, segments linear oblong *Staminal* lobes small, orbicular, white tipped with yellow.

3 **P. imbricatum,** *Roxb Hort Beng* 1, *Fl Ind* i 6, spike oblong from the side of the petiole main bracts oblong obtuse, corolla segments shorter than the tube, fruit usually 3 seeded *Horan Prodr* 11 Maranta imbricata, *A Dietr Sp* i 30

CHITTAGONG, *Roxburgh*

Habit of *P capitatum* and *parviflorum* *Leaves* 1½–2 ft, oblong, acute, long minutely *Staminal lobes* bracts, much smaller leaves and more slender petiole, collected at Rangoon by McClelland, probably represents a distinct species

4 **P. macrostachyum,** *Wall Cat* 6612 A, B, spike long lax from the side of the petiole, main bracts lanceolate complicate, fruit 1-seeded

PEGU, *Wallich* TAVOY, *Gome* TENASSERIM, *Helfer*

Rootstock short, with copious slender fibres *Leaves* nearly 4 by 3–4 in, thin oblong, caudate, petiole twice as long as the blade *Spike* sessile, 9–12 in, main bracts 2–4 in, spaced out on the rachis, ascending, finally scarious *Fruit* small, smooth, oblong, crowned with the small green lanceolate sepals —*P. musaceum*, *Wall Cat* 6612 C, from the Irogla hills, known in leaf only, is probably a different species

5 **P. spicatum,** *Roxb Hort. Beng* 1, *Fl Ind* i. 5; spike radical shortly peduncled, main bracts ovate imbricate, corolla segments shorter than the tube, fruit usually 3-seeded. *Wall. Cat* 6617; *Horan Prodr.* 11. Maranta caespitosa, *A Dietr. Sp* i. 30.

6 **P. Griffithii,** *Baker* spike radical long peduncled, bracts bifarious with tips rounded recurved, corolla segments unequal upper erect oblong lateral reflexed P spicatum *Griff Notul* iii 418, *non Roxb*

MALACCA, in wet jungles at Ching *Griffith*
Leafy stem many leaved, petiole 3–4 ft, blade oblong 2 ft. *Peduncle* 1 ft *Calyx* segments linear, white, shorter than the tube *Ovary* 3 celled

7 **P. zeylanicum,** *Benth in Gen Plant* iii 653, spike shortly peduncled radical, main bracts ovate imbricate, corolla segments shorter than the tube fruit 1 seeded *Trimen Cat Ceyl Pl* 92 Maranta spicata, *Thw Enum* 320 *excl syn Roxb*

CEYLON, in the central province, rare, *Thwaites*
Habit exactly of *P spicatum* *Leaves* oblong caudate ½ ft, petiole slender, twice as long as the blade *Spike* 1½ in, main bracts few, green, not 1 in. *Fruit* small smooth oblong, crowned by the small green linear sepals

8 **P. Cadellianum,** *King mss*, spike shortly peduncled radical, main bracts ovate lanceolate fruit 1 seeded

ler *Leaf* oblong 9–10 in by 3 4 in, e 1½ in, bracts 1 1½ in, few, closely *Fruit* oblong smooth, ¼ in, crowned with the short sepals

22 CANNA, *Linn*

Rootstock perennial *Stem* simple leafy *Leaves* large, oblong, acute *Flowers* a lax terminal simple or branched raceme, bracts small, ovate *Sepals* 3 small, oblong or lanceolate *Corolla* tube cylindric, segments 3 lanceolate equal *Staminal tube* cylindric, segments petaloid unequal,

and the following —

C. indica, *Linn* var C ORIENTALIS *Rosc Scit Pl* t 12, *corolla* tube ter he rt, & m t

ii, fig 2

Throughout INDIA from the HIMALAYAS to CEYLON and MALACCA —DISTRIB Malay Isl s &c

Rootstock tuberous, with many fibres *Stem* 3–4 ft *Leaves* oblong, acute, lower 1 ft or more *Bracts* ½ in ovate, green *Sepals* small, lanceolate *Corolla-tube* ¼–½ in , lobes 1 in , lanceolate, greenish Outer *staminal segments* 3, bright red, oblanceolate, 1½ in by ¼–½ in , lip rather shorter, anther ¼ in *Capsule* globose, ½ ¾ in *Seeds* black, the size of a pea

Var FLAVA, *Rosc Scit Pl* t 13, stature of the type, staminal segments plain bright yellow. C flavescens, *Link, Horan Prodr* 41

Var C NEPALENSIS, *Wall Cat* 6622 (sp), stem much taller, leaves larger, corolla segments 1½ in outer staminal segments usually 3 bright red not emarginate, capsule above 1 in *Bouché in Linnæa*, VIII 158, *Horan Prodr* 15 —Nepal, *Wallich*

Var C SPECIOSA, *Rosc Scit Pl* t 17 (sp), much taller than the type, leaves larger, outer staminal segments 2 acute bright red with a channelled yellow claw, lip variegated with red and yellow *Herb in Bot Mag* t 2317, *Wall in Bot Reg* t 1276, *Horan Prodr* 16 —Nepal and Kumaon

Another Indian form, unknown to me, is C exigua *Bouche, Horan Prodr*, 16 The American form to which Roscoe and Horanmow restrict the name INDICA is figured Rosc Scit Pl t 1, Bot Reg t 776

23 MUSA, *Linn*

Stem subarborescent, of convolute leaf sheaths *Leaves* very large, oblong
upper ma
down one
shorter, w
rudimentary or 0, filaments stout, filiform, anthers linear erect 2 celled *Ovary* 3 celled, ovules many superposed, style filiform from a thickened base, stigma subglobose 6 lobed *Fruit* fleshy, indehiscent, oblong or fusiform, trigonous *Seeds* subglobose or angled by pressure —Species about 20, tropics of the Old World

* Not stoloniferous, dying after flowering *Bracts* many fld *Fruit* not pulpy and edible

1 **M. superba**, *Roxb Hort Beng* 19, *Corom Pl* t 223, *Fl Ind* i 667, stem short stout ovoid, leaves sessile on the sheath, bracts large orbicular many-fld dull red, calyx 3 cleft petal shorter than the calyx obcordate with a large mucro, fruit oblong subcoriaceous *Wall Cat* 5166, *Wight Ic* t 2017, *Grah in Bot Mag* t 3849–3850, *Dalz & Gibs Bomb Fl* 272, *Horan Prodr* 41 M textilis, *Grah Cat Pl Bomb* 213, non *Nee*

WESTERN GHATS

Whole plant 10–12 ft *Stem* covered with the persistent sheaths of the leaves *Leaves* 8–10
nearly a foot long an
or more to a bract
¼ in *Fruit* trigonous
globose

2 **M. nepalensis**, *Wall in Roxb Fl Ind ed Wall & Carey*, II 492, stem short stout ovoid, leaves sessile on the sheath, bracts large ovate many fld dull purple, calyx 3 cleft, petal obcordate with a large mucro shorter than the calyx, fruit oblong subcoriaceous *Horan Prodr* 41.

Lower hills of NEPAL, *Wallich*

Habit of *M superba* *Trunk* 5–6 ft 2 ft diam at the base *Leaves* as in *M superba* but smaller and rather glaucous upper passing gradually into the bracts *Spike* short, drooping, lower floriferous bracts 6 in ; flowers 2 seriate 7–8 to a bract *Calyx* and *corolla* yellowish white *Fruit* and *seeds* as in *M superba*

3 **M. glauca,** *Roxb Hort Beng* 19, *Corom Pl* t 300, *Fl Ind* i 669, trunk cylindric, leaves shortly petioled, bracts ovate greenish many fl calyx 3 cleft petal obcordate with a large mucro shorter than the calyx fruit obovoid oblong subcoriaceous *Horan Prodr* 41

[illegible]

Trunk 10–12 ft below the leaves, 8 in diam *Leaves* 4–5 ft, oblong-lanceolate acute *Spike* drooping from the base, bracts numerous, imbricate the lower not ½ ft, flowers 10–20 to a bract *Calyx* pale, about 1 in ; segments 3 loosely coherent. *Corolla* not half as long as the calyx *Fruit* 4–5 in, 1½ in diam *Seeds* smooth, globose, nearly black, ½ in diam

** Stoloniferous *Bracts* many fld *Fruit* pulpy, edible

4 **M. sapientum,** *Linn Sp Plant* 1477, stoloniferous stem tall cylindrical leaves petioled spike drooping bracts ovate many fld usually deciduous calyx 5 toothed at the tip, petal shorter than the calyx, fruit pulpy *Roxb Hort Beng* 18, *Corom Pl* t 275, *Fl Ind* i 663, *Thw Enum* [illegible] *Cat Pl Bomb* 212 *Dalz & Gibs Bomb Fl Suppl* 88, *Horan Prodr* 42.—*Rheede Hort Malab* i 17, t 12–14 *Rumph Amboin* v 130, t 60, *Trew Ehret* t 21–23

[illegible] in BEHAR and the EASTERN HIMALAYAS ascending to 4000 ft — DISTRIB Mal. [illegible] cultivated throughout India and the tropics

Stem 8 12 ft *Leaves* 4 5 ft oblong, bright green above paler beneath [illegible] bracts ovate, more or less pruinose lower 6–8 [illegible] the leaves [illegible] *Calyx* yellowish white, [illegible] before the fruit matures [illegible] 2–3 in in the [illegible] about half as long *Fruit* oblong trigonous [illegible] to the base and [illegible] full of seed (seedless in the cult forms) [illegible] black, [illegible] green when ripe *Seeds* angled by pressure [illegible] wild and cultivated in [illegible] ½ in diam The principal varieties and subspecies wild and cultivated in India are —

M DACCA *Horan Prodr* 41, differs from typical *sapientum* by leaves paler [illegible] red border of the [illegible] beneath, pruinose [illegible] with a very thick skin [illegible] pale yellow fruit about 4 in long [illegible] fruit pale straw-coloured

M [illegible] ; stem and midrib of the leaf red, fruit pale straw-coloured [illegible]

M SIKKIMENSIS *Kurz in Journ Agric Hort Soc Ind* n s v 164, differs [illegible] by its duller purple [illegible] angled tubercled seeds 4–5 lin diam.—Wild in Sikkim *Hook f & Thoms* (Herb Ind Or &)

M PARADISIACA, *Linn Sp Plant* 1477, stem reaching a length of 20 ft, leaf [illegible] of 2 ft, fruit larger than in *sapientum*, ½–1 ft long [illegible] male flowers more persistent [illegible] to eat till cooked [illegible] *Linn Hort Cliff* [illegible] *Trew Ehret* t 18 20 [illegible]—Commonly cultivated wild in Ceylon, according to [illegible]

M [illegible] *Kurz in Journ Agric Hort Soc Ind* [illegible] bracts violet, [illegible] those of the male flowers convolute, fruit very small— [illegible] Malacca [illegible]

M [illegible] Soc Ind n s v 166 ; [illegible] fruit 3 in long

M CORNICULATA, (*Rumph*) *Kurz in Journ. Agric Hort Soc Ind* n s v 166, t 2-3, flower larger than in any other form, only 2-3 rarely 4 whorls of

es firmer in texture
eeds very small and

M ARAKANENSIS, *Ripley in Proc Agric Hort Soc Ind* x 51, a fibre-yielding form from Arrakan

M ZEBRINA *Flore des Serres*, t 1061-2 and M VITTATA *Bot Mag* t 3102, are handsome forms with variegated leaves Other forms are mentioned by Kurz in Journ Agric Hort Beng n s v (1878), 112-163, and Sigot in Journ Soc Nat Horticult France, 1887, 238, 285

*** Stoloniferous *Stem* slender, cylindric *Bracts* few fld., bright coloured *Fruit* not edible

5 **M. rosacea,** *Jacq Fragm* t 132 fig 4, *Hort Schoen* t 415, stoloniferous, leaves petioled, flower spike drooping or erect, bracts ovate lilac or pale red lower usually 3 fld calyx yellowish white 5 toothed, petal as long as the calyx fruit oblong trigonous pulpy *Bot Reg* t 706 *Lodd Bot Cab* t 615 M ornata, *Roxb Hort Beng* 19, *Fl Ind* i 666, *Dalz & Gibs Bomb Fl* 272

texture than in
M bracts oblong,
abo *Fruit* and *seeds*
as in typical *sapientum*

6 **M. sanguinea,** *Hook f in Bot Mag* t 5975, stoloniferous, leaves petioled spike erect or finally drooping bracts ovate lanceolate bright red lower usually 3 fld rachis pubescent, calyx bright yellow 5-toothed, petal as long as the calyx, fruit oblong trigonous pulpy

ASSAM *Mann*

Stem 4-5 ft very slender *Leaves* 2 ft, thin bright green petiole 1 ft or more *Spike* ½ ft bracts crowded imbricate, 3-6 in *Calyx* 1½ in *Fruit* 2-3 in, pale yellowish green variegated with red *Seeds* irregularly cubical, black, tubercled

IMPERFECTLY KNOWN SPECIES ALLIED TO M SANGUINEA

M ASSAMICA, *Cat Hort Bull* 1871, 6, leaves about 1 ft very unequal sided bright green —Assam

M AURANTIACA, *Mann mss*, from Assam I cannot by dried specimen of inflorescence distinguish this from *M sanguinea*

M DASYCARPA, *Kurz in Journ Agric Hort Soc Ind* xiv 301 (s p), fruit hairy —Assam

M MANNII, *Wendl mss*, differs from *M sanguinea* in the shorter stem and longer leaves —Assam

M URANOSCOPOS, *Lour Fl Coch* 643 (M coccinea, *Andr Bot Rep* t 47), Java China Cochin China.—Cultivated in India.

M VELUTINA, *Wendl and Drude in Regel Gartenfl* xxiv 65 t 823, bracts densely pubescent externally, male fl 6-9 in a cluster —Assam, *Mann*

21 LOWIA, *Scortechini*

Stemless, herbaceous *Stem* dichotomously branched. *Flowers* in a cluster from the base of the petiole, pedicelled, with a large persistent

pedicel
Corolla of
Fertile
, 2 celled
ovules many superposed style long slender, trifurcate at the stigmatose apex *Fruit* and *seeds* unknown Orchidantha, *N E Br in Gard Chron* n s xxvi (1886) 519 —Also Borneo

L longiflora, *Scortech in Nuov Giorn Ital* xvii 308 t 11

PERAK in the province of Kinta *Scortechini Kunstler*
Whole plant 3 4 ft flower bearing *petiole* 1½ ft flowerless much shorter; blade oblong 2–3 ft *Calyx* tube 4–5 in , segments rather shorter ¼ in broad Upper *petals* equal as long as the stamens lower with a white oblong blade 2 in long narrowed suddenly to a rather shorter purple claw *Style* an inch longer than the calyx tube branches of stigma channelled margins toothed

Order CL **HÆMODORACEÆ.**

Perennial herbs *Leaves* usually radical distichous narrow, nerve parallel *Flowers* bisexual in terminal spikes racemes in panicles regular *Perianth* corolline persistent lobes 6 biseriate imbricate or induplicate valvate *Stamens* 6 ... versatile 2 celled ... 3 ... of ... superior or inferior, de... partially enclosed in the fle... albumen

TRIBE I **Conostyleæ.** *Ovary cells* many ovuled

Flowers in a long simple spike or raceme — 1 ALETRIS

TRIBE II **Ophiopogoneæ.** *Ovary cells* 1 2 ovuled

Filaments connate in a ring closing the mouth of the perianth — 2 PELIOSANTHES
Filaments short free Perianth short super or — 3 OPHIOPOGON
Filaments filiform Perianth infer or tube slender — 4 SANSEVIERA

1 **ALETRIS,** *Linn*

Leaves radical narrow *Scape* leafless flowers small short spicate or racemed bracts 1 fld *Perianth tube* short subcampanulate lobes subvalvate *Stamens* 6 on the bases of the lobes filaments very short, anthers ovate or subglobose ... 3 partible or 3 fid ovules in ... half superior, loculicidally ... American and Asiatic

Aletris literalis Kunth , Wall Cat 5082 is *Aloe vera* L. (*A perfoliata*, Will)

1 **A. nepalensis,** *Hook f* leaves 5–7 nerved, flowers glabrous anthers subglobose ovary glabrous style very short capsule globosely ovoid Tofieldia nepalensis *Wall Cat* 5097 *Royle Ill* 385 Stachyopogon pauciflorus & spicatus *Klotzsch in Bot Reise Pr Wald* 10 t 94

TEMPERATE and ALPINE HIMALAYA, from KASHMIR to BHOTAN, alt 10–15,000 ft —DISTRIB China [illegible]

[illegible]

that Wallich's plant should be called *A nepalensis*

2 **A. sikkimensis,** *Hook f*, leaves 7–9-nerved ensiform, scape tall, spike very long, flowers glabrous, ovary glabrous, capsule globosely ovoid

SIKKIM HIMALAYA, Lachen valley, alt. 9 12,000 ft *J D H*

A much larger plant than *A nepalensis*, with short narrowed leaves ⅓–½ in broad, and a leafy scape with the raceme 1 2 ft high, and with linear smaller and much narrower seeds

3 **A. khasiana,** *Hook f*, leaves many nerved, flowers glandular-pubescent, anthers oblong, ovary puberulous, capsule ovoid lanceolate.

KHASIA HILLS, alt 4–6000 ft, common, *Griffith*, &c

Leaves grass like, 4 12 in, rarely ½ in broad, closely striately nerved *Scape* 6–12 in, glandular pubescent above *Flowers* usually sessile, ¼ in long, yellowish red, pinkish or purplish, bracts as in *A nepalensis* *Seeds* very minute, reniform.

2 PELIOSANTHES, *Andr*

Scapigerous herbs, rootstock horizontal *Leaves* narrow, linear or lanceolate, subplicately nerved *Scape* erect, flowers small, racemed, bracts scarious *Perianth* superior, tube short, broadly campanulate, lobes 6, [illegible] filaments very short connate in a ring [illegible] [anth]ers subsessile, slits introrse [illegible] [stigm]a subsessile, 3 lobed, ovules [illegible] *Fruit* indehiscent *Seeds* few, bursting through the pericarp during ripening, and resting on the base of the withered perianth, tube fleshy or succulent, embryo in the base of the hard fleshy albumen —Species about 8, Indian and Malayan

The species of this genus are far from well defined. Better characters than those hitherto employed for distinguishing them may perhaps be found in the number of ovules, and form of the staminal tube and anthers

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SIKKIM HIMALAYA, the KHASIA HILLS, ASSAM, CHITTAGONG and BURMA. PENANG, *Curtis*

Leaves 2–7, petiole variable in length cross nervules distinct when dry *Scape* naked or with a few scales above and large membranous sheaths at the base, raceme 6–12 in, bracts 1 3 to every fascicle of flowers variable in length, pedicels short, flowers ⅓–½ in diam, purplish or bluish-green *Seeds* as large as a pea, olive-blue

lingulate bract folded round the calyx tube and others from the pedicel *Calyx* tube long very slender, segments 3, lanceolate, reflexed *Corolla* of 3 petals, two upper small lanceolate lower large, oblong, clawed Fertile *stamens* 5, filaments short, cylindric, anthers linear, acuminate, 2 celled *Ovary* 3 celled, ovules many superposed, style long, slender, trifurcate at the stigmatose apex *Fruit* and *seeds* unknown Orchidantha, *N E Br in Gard Chron* n s xxvi (1886) 519 —Also Borneo

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Flowers in a long simple spike or raceme ... 1 ALETRIS

TRIBE II **Ophiopogeneæ.** *Ovary cells* 1-2 ovuled

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1 ALETRIS, *Linn*

Leaves radical narrow *Scape* leafless, flowers small short, spicate or racemed bra[illegible]
valvate *Sta*[illegible]
anthers ovate or [illegible]
[illegible]partible or 3 [illegible]
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TEMPERATE and ALPINE HIMALAYA, from KASHMIR to BHOTAN, alt 10–15,000

and Franchet (in Morot, Journ de Bot v 155) observe that Royle & Nepalensis, Herb Strachey & Winterb No 1 appears to belong to their *A lanuginosa*, adding that Wallich's plant should be called *A nepalensis*

2 **A. sikkimensis,** *Hook f*, leaves 7–9 nerved ensiform scape tall, spike very long, flowers glabrous, ovary glabrous, capsule globosely ovoid

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A much larger plant than *A nepalensis* with short narrowed leaves ½–⅔ in broad, and a leafy scape with the raceme 1 2 ft high and with linear smaller and much narrower seeds

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Leaves 2 7, petiole variable in length, cross nervules distinct when dry *Scape* naked or with a few scales above and large membranous sheaths at the base, raceme 6–12 in; bracts 1 3 to every fascicle of flowers variable in length; pedicels short, flowers ⅓–½ in diam, purplish or bluish green *Seeds* as large as a pea, olive blue

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Aletris litoralis, Kurz; Wall Cat 5082 in *Aloe vera* L. (*A perfoliata,* Wall)

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KHASIA HILLS, alt 4–6 000 ft common *Griffith* &c

Leaves grass like, 4–12 in rarely ½ in broad, closely striately nerved *Scape* 6 12 in, glandular pubescent above *Flowers* usually sessile ¼ in long yellowish red, pinkish or purplish bracts as in *A nepalensis* *Seeds* very minute, reniform

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difficult of definition and I am not satisfied that all the species here proposed will prove distinct from one another

* *Stem creeping and rooting, roots not tuberiferous*

1 **O. dracænoides,** *Hook f*, stem stout, leaves oblanceolate acuminate very many nerved, petiole slender, racemes about equalling the leaves *Flueggea dracænoides, Baker in Trimen Journ Bot* 1874, 174, in *Journ Linn Soc* xvii 502

[illegible] 6000 ft, *J D H*

[illegible] ted clothed at first with gre [illegible] and with short tufts of leaves and flowery scapes *Leaves* [illegible] in, including the petiole, $\frac{3}{4}$–1$\frac{1}{4}$ in broad *Racemes* 2 3 in bracts shorter than the flower, which are solitary or fascicled, white or pale lilac, $\frac{1}{3}$ $\frac{1}{2}$ in diam *Perianth* segments ovate-oblong, anthers lanceolate, filaments very short, style filiform *Seeds* oblong

2 **O. Clarkei,** *Hook f*, stem prostrate with a terminal tuft of secundly curved linear leaves which are 8–12 by $\frac{1}{6}$ in, scape short few-fld flowers $\frac{3}{8}$ in diam filaments one third the length of the lanceolate anther

SIKKIM HIMALAYA, *J D H* at Pangbee, alt 6000 ft *Clarke*

Stems 8–10 in long rigid as thick as a crow quill or thicker, bearing one rather slender terminal tuft of very long slender leaves which are faintly rough beneath *Scape* with the 3–5 fld raceme curved 3 4 in long, bracts ovate-lanceolate about equalling the pedicels which are jointed at or near the base — In this species the stem is a long runner bearing a solitary tuft of leaves and scape

3 **O. reptans,** *Hook f* stem prostrate with distant tufts of linear leaves which are 6–8 by $\frac{1}{12}$–$\frac{1}{8}$ in, scape very short slender few fld

KHASIA HILLS at Nurtiung alt 4–6000 ft *J D H* GARROW HILLS, alt 4000 ft, *Clarke*

Stems 2 3 ft prostrate rather stouter than in *O Clarkei* rigid *Leaves* quite smooth *Scape* with fruiting raceme 2 3 in *Seeds* $\frac{1}{4}$ $\frac{1}{3}$ in diam, subglobose —Very different from *O Clarkei* in habit the numerous tufts of very narrow shorter leaves, and the very short slender scapes It closely resembles a Tonkin plant (Balansa n 4155 bis)

** *Stems tufted Roots often tuberiferous*

4 **O. Wallichianus,** *Hook f*, rootstock short very stout, leaves 6–24 in by $\frac{1}{6}$ $\frac{1}{3}$ in, scape stout usually much shorter than the leaves, flowers usually fascicled $\frac{1}{4}$–$\frac{1}{3}$ in diam, anthers lanceolate, filaments very short [illegible] O japonicus *H* [illegible] Wallichianus, *Maxim in Bull Acad* [illegible] longifolius *Dcne in H* [illegible] Wallichiana *Kunth Enum* v [illegible] *Journ Linn Soc* xvii 501

TEMPERATE and SUBTROPICAL HIMALAYA; from Kumaon eastward, alt. [illegible] ft KHASIA HILLS alt 4–6000 ft

Distinguished from the following by the rootstock, usually as thick as the [illegible] sometimes 4 6 in long, the stout scape longer or shorter than the leaves [illegible] large flowers *Roots* of long cylindric tubes *Leaves* often distichous [illegible] *Leaves* [illegible] nearly quite smooth *Raceme* [illegible] fld, sometimes cylindric [illegible] in diam nearly 1 in diam, bracts usually shorter than the flowers, pedicels

jo nted about the m ldle per nth vl te or pale l la

Var au flora nore slender leaves n rrow r fl we s f
Kha a H l alt 4–6000 ft In er ned ate b tween *O Wallich*

5 **O intermedius,** *Don Prodr* 48 root-stock short
leaves 6 24 by ⅙–½ in marg ns m nute y erose scape sle
the leaves or shorter flo vers solitary or fasc cle ⅛–⅓
or *O Royle Ill*
icus var interm
Rottl ? *Wight*
v 304 F japonica
vii 310 F interme

TEMPERATE HIMALAYA from Ka l m r eastward alt 5–9000 ft
MUNNIPORE h lls alt 5– 000 ft Ghats of MALABAR MYSORE &c
CEYLON

Except by tl e usually mucl sma ler flowers and always narrow le
more oblong anthers th s ca not be d t gu s ed from small states of
l cl an s (however v dely d ffere t the e t ene states of each are) The
are the most marked for ns sele ted f o so e l undreds of spe mens
into one another an l I fear uto *O Wall c anus* The bracts a e so
tl at I l ave om tted leser b ng the

Var 3 *pa v flor* le ves very narro sec nd y cu ved scape ve
decurved flowers ¼ ⅓ n d an l te or pale purpl sh p d cels very sho t
H malaya Khas a and Munn po l lls

Var 4 *pauc ra* leaves lo ⅓ n broad not second scape n ually
long raceme sho t d cur d fe fl l ed els s ort flowers ¼ ⅓ n d am
Cat o139 C) —I l a

V r 5 *gra l es*
fil for n pet oles scap
wh te

6 O
flaccid
¼ in
distinc

TTRAN *Wall ch*
leaves an l lo g el nder racemes
c cled fl l bracts usu lly longer
idle per anth ra her membranous
wh te ? style very slend r *Seeds* ½ n long el ps d —I assume th s to be
O Malcol on a nat of Rangoon of wh ch however I have seen no authen c
spec e

7 **O micranthus,** *Hook f* leaves 10–20 by ½ in flaccid pet oled
t p obtuse scape rather stout long or short racem sub-erect elongate
fl wers su l ol tary ¼ in l am anthers se s le oblong obtuse

The H malayan species of Ir s are v . . . . drawings are much wanted w th descr . I Xiphion of Europe and the East a collected in Br t sh Ind a and Prof . . . . European and Eastern I Sisyrinchium L a spec es with the filaments un ted be low occurs in the Punjab It is a native of Affghanistan The character of bearded and crested sepals s art ficial and inconstant in this genus

* *Rootstock* a coated bulb or corm (Xiphion)

1 **I. Aitchisoni,** *Boiss Fl Orie* . . . spathes 1 fld sepals shortly clawed stamens adherent to the style arms *Chron* 1876 i 723 *in Trim Journ B Soc* xvi 124

The PANJAB Salt range alt 3000 ft., *Vicary, Aitchison* —DISTRIB Affghan stan

Corm 2 in long ovoid coats brown sh ning *Stem* ½ 1½ ft slen ler 1 3 fld. *Leaves* as long ¼ in broad *Spathes* 2 2½ in lanceolate green *Perianth* l lac or yellow tube 1 1½ n blade ¼ n petals much sl orter spread ng l nb small 3-cusp late *I Stocksii* Bo ss. Fl Orient v 123 of Beluch stan is closely all ed to *I Aitchisoni* but is a dwarf spec es w th lanceolate pl ate leaves

Var *chrysantha* Baker has tl e stem 2 ft and much stouter an l flowers yellow

** Rootstock stout prostrate and creeping

§ Sepals neither crested nor bearded

2 **I. ensata** . . . [illegible]

Boiss Fl Orient v 1.. *Baker in Journ Linn Soc* xvi 139, *in Gard Chron* 1876 ii 3.3 *Regel Gartenfl* t 1011 I biglumis *Vahl Enum* ii 149, *Sweet Brit Fl Gard Ser* ii t 187 I triflora *Balbis Misc Bot* vii t 1 *Redoute Lil* t 481 I Doniana *Spach Hist Veg* xiii 34 I Pallasii *Fisch Reichb Ic Fl Germ* t 469 *Bot Mag* t 2331 I fragrans *Lindl in Bot Reg* xxvi t 1 I longispatha *Fisch in Bot Mag* t . 28 I Moorcroftiana *Wall Cat* .. *Don in Trans ...* Soc xviii 315 I pal ulina *Maxim* ... *Herb* 1888 . 8 (name) Xiphion Donianum *Alef II in Bot Zeit* (1863) 297 Ioniris Doniana fragrans, triflora & Pallasii *Klatt in Bot Zeit* 1872 502

WESTERN HIMALAYA and WESTERN TIBET alt 5 9000 ft *Royle* &c —DISTRIB Temp Asia

Stems tufted sl ort or 1½ 2 ft stout or slen ler sheath s fibrous *Leaves* 1½ ft by ¼ ½ in *Spathes* 3 4 in 1 3 fld valves lanceolate green *Flowers* ped celled ovary 1 in cyl n lr c t ale of sepals 1½ 2 by ¼ ½ in claw rather l ng r petals ½ in broad; style-arms 1 in crests large deltoid *Capsule* 1½ 3 in by ½ ¾ in, ribbed beaked r be round ed

3 **I. spuria,** *Linn* . . . . strongly striate spathes . c f sepals orb cular half as . . . . defl xed *Bot Mag* t 58 *Fl Germ* ix t. . I . ent x t. 615 I hal phila . . . *Bot Mag* . *Fl Orient* v 1.3 Xyr dion Nothum and sp irium *Klatt in Bot Zeit* 187. 4 ..

KASHMIR alt 6000 ft *Clarke* —DISTRIB Westward to Russia

Stem 2–3 ft sheathed *Leaves* ½–1½ in broad *Spathes* 2–3 in near oblong firm green *Flowers* 2–3 in diam bright lilac sepals ½ in broad claw keeled petals ⅓–½ in broad style arms 1 in long crests small deltoid *Capsule* 1–2 in 6-ribbed long beaked —A very common Oriental plant Baker refers the Kashmir specimens to *I Nothia* as a variety with very stout stems broad leaves and large flowers

4 **I aurea,** *Lindl in Bot Reg* xxxiii t 59 tall stout leaves ensiform spathes 2–3 fld flowers long pedicelled yellow ovary as long as the perianth tube blade of crisped and crenulate sepals oblong as long as the claw petals shorter oblanceolate style arms with entire broad incurved lobes *Baker in Gard Chron* 1876 ii 584 I crocea *Jacquem* mss Xyridion aureum *Klatt in Bot Zeit* 1872 501

WESTERN HIMALAYA Kashmir *Royle Jacquemont*

Stem 3–3½ ft stout terete with leafy sheaths *Leaves* 1½–2 ft by ¾–1 in *Spathes* 3–4 in valves lanceolate green *Flowers* bright yellow sepals 2½–3½ in blade 1 in broad style arms 1¼–1½ in long crests 1 lto 1 *Capsule* 1½ in long oblong 6-angled beaked —Differs from *I spuria* chiefly in the yellow flowers

I [illegible]

MUNNIPORE summit of [illegible] alt 6000 ft *Watt*

Stem with 5–6 flower heads on erecto-patent peduncles *Leaves* [illegible] 18 by 1½–2 in as long as the stem *Spathes* with the outer valve 1–1½ in lanceolate thin green inner much shorter oblong obtuse pedicels short jointed with the ovary *Flowers* pale lavender blue tube ½ [illegible] blade of sepals ¾ [illegible] broad striped and spotted with purple throat yellow petals ½ in broad style arms ½ in long crest deltoid lacinate *Capsule* small oblong obtusely trigonous —Baker from whose description much of the above is taken says of the sepals apparently not crested —Botanical specimens from Griffith of this or an allied species have stout compressed grooved stems and firmer spathes

§§ Sepals crested

6 **I Milesii,** *M Foster in Gard Chron* 1883 i 231 tall stout leaves very broadly ensiform flower heads branched spathes many fld perianth tube rather short sepals spreading blade as long as the claw obovate crests sharply toothed petals as large spreading oblong undulate style arms with a large fimbriate crest *Baker* *Bot Mag* t 6889

WESTERN HIMALAYA Kulu and Parbutti valleys alt 4000 ft *Brandis*

Stem 3 ft as thick as the little finger leafy upwards sheaths at the forks 4–6 in *Leaves* 1½–2 ft by 1–2 in broad pale green firm strongly curved *Spathes* 1½ in valves oblong obtuse pedicels short jointed at the tip flowers 2–4 in diam large ovary clavate perianth tube ½ in blade of sepals [illegible] purple crest yellow style arms 1 in blue purple crest [illegible] —Possibly this is the tall *Iris* mentioned by Stewart (Panjab Plants [illegible]) as found in the Beas valley alt 5–10,000 ft and used for thatching

7 **I nepalensis** *Don Prodr* 54 (not of Wall) stem slender leaves linear spathes 1–3 fld flowers shortly pedicelled perianth tube slender blade of sepals oblong as long as the claw crests narrow petals oblong

broad flat sides 11; *Baker in* I decora, *Wall.* 313, *Royle Ill.* sulcata, *Klatt in Linnæa*, xxxiv 588, 590

TEMPERATE HIMALAYA, from the Punjab and Western Tibet eastwards, alt. 5-10 000 ft. KHASIA HILLS, alt 5-8000 ft.

Rootstock with densely fibrous sheaths, and copious fleshy finger-like roots; stem ½ 1 ft; flower heads 1 2 *Leaves* 6 in long at flowering time, elongating to 24 by ¼ in, streaked with purple lines and dots *Spathes* 1½-2 in long, outer valves thin, green, persistent, pedicels very short. *Perianth-tube* 1½ in, limb 1-1½ in, pale lilac, blade of sepal ... 1 in and less *Capsule* ob ... —Prof Foster informs m ... *Hemerocallis*. Hemsley ... this, 3-4 in high, as hav... 4000 ft. elevation

§§§ Sepals bearded

† *Dwarf species, stems* 12 *in or less*

8 **I. gilgitensis,** *Baker mss*, dwarf, leaves linear, flower-heads solitary, spathe 2-fld, pedicels short, perianth tube long, blade of sepals small narrow oblong much shorter than the strongly bearded claw, petals oblong.

WESTERN TIBET, at Gilgit alt 12,000 ft, *Giles*

Stems tufted, 1-6 in basal sheaths entire *Leaves* flaccid, 6-9 by ⅛-¼ in *Spathe* 1½ 2 in, valves lanceolate green, margins pale. *Perianth tube* less than 1 in, limb 1½ in, bright lilac, blade of sepals ¼ in broad, petals clawed; style branches ¾ in, crests small, deltoid —Differs from *I kumaonensis* by the small blade of the sepals A single specimen only seen

9 **I. kumaonensis,** ... *t* 5052, dwarf, leaves linear, flower- ... very short, perianth-tube very long, ... obovate as long as the bearded claw, petals erect, ... oblong capsule ellipsoid or subglobose beaked. *Don in Trans Linn Soc* xviii 311, *Royle Ill* 372, *Baker in Gard Chron* 1876, ii 710 I. Kingiana, *M Foster in Gard Chron* 1887 i 611, *Baker in Bot Mag* t 6957 I tigrina *Jacquem mss*

WESTERN HIMALAYA, from Kashmir to Kumaon, alt 8 12,000 ft.

Stems 2-12 in, crowded, outer basal sheaths fibrous *Leaves* 12-14 by ¼ in ... 1½-2 in, ... claw of ... ¾ in ... trigonous, angles obtuse.—Don describes the sepals as blood red with black purple spots

10 **I. goniocarpa,** *Baker in Gard Chron* 1876, ii 710, *in Journ. Linn. Soc.* xvi 145, dwarf, slender, leaves narrow linear, flower-heads solitary, spathes 1-2 fld, flowers subsessile, perianth-tube long, sepals cuneately-oblong, keel strongly bearded, petals erect, blade oblong, capsule trigonous with broad flat sides and a long slender beak

SIKKIM HIMALAYA, alt 10 13 000 ft., *J D. H*

Stem 6 in, 1 leaved, sheaths fibrous *Leaves* 6 8 by $\frac{1}{12}$ in *Spathes* 1 in long, valves lanceolate persistent. *Perianth tube* ½-¾ in; blade of lilac sepals ¼ in broad;

style-arms ½ in ; crests large, deltoid, acute *Capsule* exactly as in *I nepalensis*, of which this may be a variety, but the sepals are strongly bearded

11 **I. Duthiei,** *Foster in Gard Chron* 1887, i 611, dwarf, leaves ... long, blade ... the bearded

... variety, in the reddish lilac flowers, with darker veins *Capsule* 1¼ by 1 in, trigonous As in *I kumaonensis* the flowering precedes the mature leafing

12 **I. Hookeriana,** *Foster in Gard Chron* 1887, i 611, dwarf, leaves linear, flower-head solitary, spathes three 2 fld, persistent perianth-tube short, blade of sepals obovate-cuneate gradually narrowing into the thickly bearded claw, blade of erect petals narrowly obovate capsule small trigonous beaked

WESTERN HIMALAYA, Lahul (*Hort Foster*)

Stem 5–6 in, sheaths torn *Leaves* immature at the flowering season, at length 24 by ½–¾ in, pale green *Spathes* about 5 in long, valves lanceolate ventricose *Perianth tube* ¾ in, limb 1½–2 ... broad, purplish blue blotched with d... beard white yellow tipped, blade of ... channelled claw, style-arms very ... ly serrulate *Capsule* oblong

†† *Stem* 1 *ft or more*

13 **I. Clarkei,** *Baker mss*, stem tall stout, leaves linear or ensiform strongly striate, flower-heads 1–2, spathes 1–2 fld, valves green to the tips, pedicels nearly equalling the spathe, perianth tube short infundibular, blade of sepals oblong cuneate with a bearded erect claw, blade of petals small oblong, claw long, capsule oblong obtuse at both ends

SIKKIM HIMALAYA alt 10–11,500 ft, *J D H*, *Clarke*

Rootstock very stout creeping, sheaths long, fibrous *Stem* 10–24 in, fruiting very stout, 2 leaved *Leaves* not membranous at the tips, at length 1½–2 ft by ⅓–½ in *Spathes* 2½–3 in, valves lanceolate, persistent *Perianth* bright lilac blotched with violet, throat yellow, tube ½ in, limb 2 in, blade of sepals ¾ in broad, style arms 1 in long, bright lilac, crests square *Capsule* 1½–2 in, oblong, trigonous, valves thick, rigid, keeled at the back —The leaves are very variable, linear and ½ in broad in small fld specimens

DOUBTFUL SPECIES

Of the following except *I longifolia*, all are supposed to be either garden plants or originally garden escapes, and probably identical with Persian species The attention of Indian botanists should be given to them

I DEFLEXA, *Knowles and Westc Flor Cab* ii 19 t 57 (*Lindl Bot Reg* 1840, *Misc* 25, 34, *Baker in Gard Chron* 1876, ii 774 (in part) I germanica, var. nepalensis, *Herb in Bot Reg* l c 34 Baker, who characterizes the plant of the Floral Cabinet by the scarious tips of the spathes and deflexed stem, considers it to be intermediate between *germanica* and *pallida*, but as he has included under it the *nepalensis* of Royle & Wallich, some of which are certainly different, his view is perhaps not correct Herbert, who cultivated authentic specimens, says that the deflexed stem was due to its being grown in heat, and that it is a var of *germanica*, and is *I nepalensis Wall in Bot Reg* t 818

I KASHMIRIANA *Baker in Gard Chron* 1877, ii 744 (Kashmir to Kumaon). Differs, according to Baker, from *I florentina*, in the sweet-scented pure white flowers with the spathe-valves scarious at the tips only, and the pure milk white stigmas two thirds as long as the perianth with large crests

I. LONGIFOLIA, *Royle Ill.* 372. t. 91, f. 2; Baker is disposed to regard this as a long-leaved form of *I. nepalensis*, Don Prodr. (not of Trans. Linn. Soc.). Prof. Foster thinks it is an entirely different plant, apparently allied to *I. ruthenica*.

I. NEPALENSIS, *Wall. Cat.* 5050 *in part*, a native of Nepal and Kumaon. There are two plants under this number in Herb. Wall., one a solitary specimen, with spathes scarious throughout, the others with them green throughout. Of this latter there is an excellent drawing by Wallich's artist made in Nepal. Except in the very pale flowers it may be a *I. germanica*, but Royle (Ill. Him. Pl. p. 372) says that he perceived a distinct smell of Orris root (as of *I. florentina*) in Wallich's specimen which is against its being *germanica*. The specimen with scarious valves looks more *I. florentina*, but it has no roots.

I. NEPALENSIS, *Wall. mss. in Lindl. Bot. Reg.* t. 818 (from Nepal, *Wallich*). This has the dark blue flowers of *I. germanica*, very unlike the Wallichian drawing of *I. nepalensis*; it may or may not agree in colour with some of his specimens. Herbert makes it a var. of *germanica*, but gives no varietal character. Baker cites it under *decora*.

I. NEPALENSIS, *Wall. ex D. Don*, in *Trans. Linn. Soc.* xviii. 310. This is a mixture of Wallich's, Royle's and the Bot. Reg. *nepalensis*, in consequence of which the root is described as fragrant, as in *I. florentina*, and used for similar purposes. Don distinguishes it from *germanica* by the shorter scarious ventricose spathes (while they are not in Wallich's plant!) entire sepals, longer slender tube, and more coarsely serrated stigmatic lobes. Don has a variety with the scape undivided, sub 2-fld., shorter than the leaves, but these are characters of Wallich's drawing of his type.

I. NEPALENSIS, *Wall. ex Royle Ill.* 372, t. 90, f. 2. I have seen no specimen of this, which is a native of Garwhal, on the ascent to Surkunda. It has a pa[le] flower and "orris" scented roots.

CROCUS, *Linn.*

Rootstock a sheathed corm; stem 0. *Leaves* radical, narrowly linear [illegible] ry or fascicled subsessile [illegible] the ovary and sometimes [illegible] d tub very slender, lim[b] subequally 6-lobed in two series. *Stamens* on the throat of the perianth, filaments short, anthers longer, basifixed. *Ovary* 3-celled, style filiform, arms slender subentire lobed or laciniate, tips stigmatic. *Capsule* oblong, membranous, loculicidal. *Seeds* subglobose.—Species about 70, European and W. Asian.

C. sativus, *Linn. Sp. Pl.* [illegible], sheaths of corm closely reticulate [illegible] t autumnal appear [illegible] yellow, style arm[s] [illegible] *Maw Gen. Croc.* [illegible] 91, f. 1, *Stewart* [illegible] *Fl. Germ.* t. 350; *Benth. & Trim. Med. Bot.* 274.

KASHMIR, cultivated only. Native of South Europe.

The Kashmir saffron is regarded by Royle as a variety of that cultivated in England, distinguished by the very dark violet blue flowers, yellow anthers and brick-red stigmas, but this accords exactly with the common form figured by Bentley and Trimen.

BELAMCANDA, *Adans.*

Rootstock creeping, stem erect, leafy. *Leaves* ensiform, equitant. *Inflorescence* branched, sheaths membranous, spathes several-fld., sub-scarious, bracts scarious; flowers pedicelled. *Perianth tube* very short

segments oblong, spre
perianth, filaments
style filiform arms
membranous, loculic
persistent and free

1 **B. chinensis,** *Leman in Red Lil* t 121, *Baker in Journ Linn Soc* xvi 113 B punctata, *Moench Meth* 529 Pardanthus chinensis, *Ker in Kœnig & Sims Ann Bot* i 246, *Miquel Fl Ind Bat* iii 579, *Royle Ill* 371, *Lodd Bot Cab* t 1874, *Flore des Serres* t 1632. P nepalensis, *Sweet Brit Fl Gard Ser* ii 498 Ixia chinensis, *Linn Sp Pl* 36, *Gærtn Fruct* t 13, *Bot Mag* t 171 Moræa chinensis, *Murr Syst Veg* 93, *Roxb Fl Ind* i 170 —*Rheede Hort Mal* xi t 37

Very doubtfully wild in the HIMALAYA, ascending to 6000 ft Cultivated all over INDIA, a native of China

Order CLII **AMARYLLIDEÆ.**

Rootstock bulbous tuberous or a corm *Leaves* radical *Scape* naked (in the Indian genera) *Perianth*-superior regular or irregular, tube long short or 0 limb 6 lobed or partite, with sometimes a crown at the mouth. *Stamens* 6, on the bases of the segments, rarely epigynous filaments free or connate, anthers erect or versatile *Ovary* 3 celled, style stout or slender, stigma simple or cleft, ovules many, 2 seriate in the inner angle of the cells, anatropous *Fruit* usually capsular loculicidal, rarely fleshy and bursting irregularly *Seeds* few or many albumen fleshy enclosing the small embryo —Genera 64 species about 650

The American Aloe *Agave americana*, Linn (*A cantula*, Roxb Fl Ind ii 167) is planted as a hedge in the Punjab (Stewart, Panjab Plants, 232) and introduced elsewhere in India *A vivipara*, Linn (Wight Ic t 2024) is naturalized in the Deccan *Zephyranthes tubispatha*, Herb a Peruvian plant, resembling a small *Pancratium* but without a corona is cultivated in gardens and found as an escape far from habitations

Tribe I HYPOXIDEÆ Rootstock tuberous Flowers spicate or racemose

Ovary not produced above the crown into a stipes   1 HYPOXIS
Ovary produced into a short or long stipes above the crown   2 CURCULIGO

Tribe II AMARYLLEÆ Rootstock bulbous Flowers umbelled

Filaments free   3 CRINUM
Filaments united by a membrane   4 PANCRATIUM

1 **HYPOXIS,** *Linn*

Leaves radical narrow strongly
... mbellate *Perianth* rotate, 6-par
... istent *Stamens* 6 on the base of
... erect, dorsifixed *Ovary* 3-celled,
... r connate, ovules
... *Seeds* subglobose,
... about 50, widely

1 **H. aurea,** *Lour Fl Cochin* 200, villous or hairy, leaves narrowly linear, scape slender 1-2 fld ovary and perianth lobes externally hairy,

anthers sagittate *B* ...
Mus Lugd Bat iv 1
H Franquevillei, *Mi*
Cat 5164 Curculig
Dal & Gibs Bomb Fl 276

SUBTROPICAL HIMALAYA, from Kashmir eastwards, ascending to 7000 ft in Sikkim KHASIA HILLS, BENGAL BEHAR and BURMA, and in the Western Ghats from the Concan southward (Not in Ceylon) —DISTRIB Java, China, Japan

Dœcious *Rootstock* globose or elongate and erect crowned with fibrous remains of old leaves *Leaves* 4 12 by $\frac{1}{12}$-$\frac{1}{4}$ in, subcoriaceous keeled *Scape* 1-4 in filiform hairy bracts setaceous *Ovary* clavate *Perianth lobes* $\frac{1}{4}$-$\frac{1}{3}$ in, elliptic lanceolate yellow outer green on the back *Capsule* $\frac{1}{4}$-$\frac{1}{3}$ in, clavate, at length 3 valved crowned with the erect perianth lobes, walls thin *Seeds* black, tuberculate

2 CURCULIGO, *Gærtn*

Rootstock tuberous, or a coated corm *Leaves* lanceolate and plaited, or linear and flat *Scape* short or long, flowers often unisexual, spicate or racemed or subcapitate *Perianth* usually produced above the ovary as a solid stipes bearing the rotate limb *Stamens* ovary and seeds of *Hypoxis* *Fruit* indehiscent usually more or less beaked —Species about 12, tropical

Sect I MOLINERIA Perianth limb sessile or very shortly stipitate above the ovary

1 C. recurvata, *Dryand in Ait Hort Kew* Ed 2 ii 253, leaves long petioled lanceolate plicate glabrous or with the nerves beneath hairy, scapes many flattened villous, flowers in a decurved subcapitate raceme, ovary turbinate berry globose hairy *Bot Reg* t. 770 *Roxb Fl Ind* ii 145, *Benth Fl Austral* vi 448 *Miquel Fl Ind Bat* iii 585, *Wall Cat* 5163 C villosa *Wall Cat* 5163 B Molineria recurvata *Herbert Amaryllid* 84, *Baker in Journ Linn Soc* xvii 120 *Kurz in Ann Mus Lugd Bat* iv 176 M plicata *Colla, Hort Ripp App* ii 3 t 18 M capitulata, *Herbert l c* Leucojum capitulatum, *Lour Fl Cochin* 193 Hypoxis Saarpata *Herb Ham*

TROPICAL HIMALAYA; from Nepal eastwards BENGAL CHITTAGONG and BURMA CEYLON, at Saffragam —DISTRIB Malay Islands S China Australia.

Rootstock tuberous. *Leaves* very variable 2 3 ft by 3 6 in recurved narrowed into a channelled petiole 1 2 ft, villous below glabrous above *Scape* 3-9 in, stout or slender, bracts spathaceous, lanceolate, villous, heads of flowers 1-4 in diam, villous; flowers pedicelled *Ovary* $\frac{1}{4}$-$\frac{1}{3}$ in villous bracts 1 1½ in, cells about 10-ovuled *Perianth* about ½ in diam outer segments villous on the back *Filaments* very short anthers cohering *Berry* $\frac{1}{4}$-$\frac{1}{3}$ in diam *Stigma* sub 3 lobed, shining *Seeds* black, testa deeply closely grooved

2 C. gracilis, *Wall Cat* 5160, ...
glabrous scapes many flattened tome...
elongate raceme, ovary oblong ...
gracilis *Kurz in Ann Mus Lugd* ...
Soc xvii 120

TROPICAL HIMALAYA, ... Nepal *Wallich* eastwards

Habit, &c, of C recurvata, of which it is probably a form, but more slender, with the ovary oblong ... the ... elongate Wallich's specimens have leaves 8 12 by $\frac{1}{4}$-1 in, ... slender woolly scapes few ... loose racemes and flowers ½ in diam Sikkim spe... mens have stoutly petioled leaves 2½ ft by 4½ in, and a robust scape 8-12 in ... The var *Javanica* Baker l c 121, with leaves rigidly coriaceous flowers ... in a dense gl ... I should refer to *recurvata*

C. crassifolia, [illegible]

[illegible] oblong [illegible] crassifolia, [illegible] *Soc* xvii 121

Sikkim Himalaya, *J D H.* Khasia Mts, alt 5 5000 ft, *J D H & T. T*, *Mann*, *Clarke*

Leaves 2-3 ft by 3-6 in, strongly closely plicate, petiole 1 ft stout *Scape* 2-8 in, raceme 3-4 in, bracts 1-1½ in, very variable, lower flowers pedicelled *Perianth* segments ½ in, outer hairy or villous externally *Berry* ½ in long *Seeds* globose, black, granulate

C. Finlaysoniana, *Wall Cat* [illegible]

[illegible] *Soc*, xvii 121

Travancore and Malabar, *Wight*, &c Ceylon, central province, ascending to 5000 ft

Leaves 12-24 by 1-1½ in, thin, 5-nerved, finely acuminate, sometimes sparsely hairy, petiole very slender *Scape* short, slender, pedicels 1-1½ in, capillary, bracts filiform *Racemes* with the upper flowers male *Perianth* segments ½ in long, of males shorter *Fruit* ½ [illegible] in, curved, few seeded, walls thin *Seeds* ovoid-oblong, finely deeply striate, black, shining

Var linearifolia, *Thwaites l c* has narrow almost linear leaves

Sect II Curculigo proper. Ovary narrowed into a long beak or stipes supporting the perianth limb

5. **C. orchioides,** *Gærtn Fruct* i 63, t 13 polygamous, leaves long- or short petioled or subsessile lanceolate membranous plicate glabrous, scape very short subterranean flowers subsessile bracts lanceolate membranous, ovary small amongst the leaf bases, stipes of the perianth long filiform, stigmas 3 erect separate, capsule oblong *Baker in Journ Linn Soc* xvii 124, *Roxb Cor Pl* i 14 t 13 *Fl Ind* ii 144 *Thwaites Enum.* 324, *Grah Cat Bomb Pl* 215 *Bot Mag* t 1076, *Wall Cat* 5158; *Miquel Fl Ind Bat* iii 585 C malabarica *Wight Ic* t 2043, *Dalz & Gibs Bomb Fl* 276 C brevifolia, *Dryand in Ait Hort Kew* Ed 2, ii 253, *Wight Ic* t 2043, *Grah Cat Bomb Pl* 215, *Dalz & Gibs l c* Hypoxis dulcis, *Steud Pl Hohenack* No 136 Gethyllis fusiformis *Herb Ham.* Tranquevillea major, *Zoll ex Kurz in Journ As Soc Beng* 1870, ii 84 —*Rheede Hort Mal* xii t 59

Subtropical Himalaya, from Kumaon eastwards ascending to 6000 ft The Khasia Hills, Munnipore, and the Western Ghats from the Concan southward —Distrib Java

[illegible] stout in proportion [illegible] petiole 6 in or less [illegible] flowers distichous, [illegible] h segments ¼ ⅓ in

Ovary villous, the stipes and perianth alone epigaeous, stigma 3-cleft, cells 6-8 ovuled *Capsule* ½ in, oblong, hypogeous 1-4 seeded beak slender, septa spongy *Seeds* ⅛ in long, oblong, deeply grooved in wavy lines, black, shining *Male fl* with no ovary, style or stigma

6 **C. latifolia,** *Dryand in Ait Hort Kew*, Ed 2, ii 253, polygamous, leaves long petioled lanceolate membranous plicate glabrous or sparsely hairy beneath, scape very short villous or 0, flowers sessile in an hypogeous oblong or globose head with the filiform stipes of the perianth epigæal, bracts ovate-lanceolate acuminate hairy, style filiform, stigmas 3 small *Baker in Journ Linn Soc* xvii 125, *Bot Mag* t 2034, *Bot Reg* t 754, *Miquel Fl Ind Bat* iii 585 C sumatrana *Roxb Fl Ind* ii 146, *Lodd Bot Cab* t 443 *Wight Ic* t 2042 Molineria sumatrana, *Herb Amaryllid* 84 M latifolia & plicata, *Kurz in Ann Mus Lugd Bat* iv 176

BURMA, the MALAY PENINSULA and ANDAMAN ISLANDS —DISTRIB Malay Islands

Leaves 1-2 ft by 1½-2½ in , s of male fl much longer than ng, clavate or pyriform, hairy

aves 1½-2 ft by 4-5 in sparsely villous dense ovoid head (Singapore Java) —

1-1½ ft by 1½-2 in glabrous b Malacca) —4 Leaves 8-12 b

y stout. ll Cat

8 CRINUM, *Linn*

Rootstock bulbous *Leaves* elongate lorate or ensiform *Scape* solid *Flowers* large umbelled spathes 2 bracts linear *Perianth* funnel or linear to oblong *Stamens* declinate, anthers linear, ules few or many *Fruit* subglobose, membranous or coriaceous, bursting irregularly *Seeds* few, large rounded, testa thick albumen very copious —Species about 60, tropical Asiatic, African, Australian and American

The identification by herbarium specimens of this genus is impossible, and I have little confidence in the following attempt to systematize the Indian ones, in which I have been guided by Herbert and Baker

Sect I STENASTER *Perianth* erect, salver shaped lobes linear *Stamens* very long spreading

1 **C. asiaticum,** *Linn Sp Pl* 419 (*in part*), leaves very many 3-4 ft by 5-7 in flat scape 1½-2 ft compressed spathes 3-4 in , umbels 10-50-fl , pedicels ½-1 than the filaments *Herb Amaryllid* 24 , *Wall Cat* 8× A *Wight Ic* t 2021-2, *Lodd Bot Cab* t Amaryllis carnosa, *Herb Ham*

Throughout TROPICAL INDIA, wild or cultivated CEYLON; common on the coast, *Thwaites*

Bulb very large, neck 4-5 in *Leaves* thin edges smooth *Scape* often 1 in diam , sheaths thick *Flowers* white, fragrant at night, tube greenish; lobes revo-

[illegible] *Fruit* subglobose, usually 1-seeded.

[illegible] perianth-tube and lobes each [illegible] *Carey ex Herb.* in *Bot. Mag.* t 2684

2 **C. defixum,** *Ker in Quart Journ Sci* iii (1817), 105, leaves few 2-3 ft by ¾-1 in erect linear obtuse concave, scape 1½-2 ft stout, umbels 6-15 fld, spathes 1½-2 in ovate-lanceolate, perianth white, tube 2½-3 in., lobes nearly as long narrowly linear lanceolate much longer than the stamens *Herb Amaryllid* 255, *Kunth Enum* v 562, *Bot Mag* t 2208, *Lodd Bot Cab* t 362, *Baker Handb Amaryllid* 76 C asiaticum, *Roxb Fl Ind* ii 127, *Wall Cat* 8969 *G, H, I in part* C. asiaticum var angustifolium, *Wall Cat* 8969 G, H Amaryllis vivipara, *Lamk Encyc* i 123 A cœnosa, *Herb Ham*

Swampy river banks throughout INDIA ? CEYLON, in the hotter drier regions, *Thwaites*

[illegible] *flowers* sessile, fragrant [illegible] *Fruit* subglobose,

3 **C. ensifolium,** *Roxb Fl Ind* ii 129, leaves erect 12-18 by 1-1¼ in ensiform tapering to the acuminate tip concave, scape rather slender, umbels 10-12 fld, spathes 1½-2 in, perianth white tube 3½ in. rather longer than the linear lobes which are about as long as the stamens *Herb Amaryllid* 255, *Bot Mag* t 2301, *Kunth Enum* v 563 C defixum, var ensifolium, *Baker Handb of Amaryllid* 76 C Roxburghii, *Grah Cat Bomb Pl* 215, *Dalz & Gibs Bomb Fl* 275.—*Rheede Hort. Malab* xi t 38

Banks of the DECCAN rivers PEGU, *Carey*

I follow Roxburgh and Herbert in keeping this distinct from *defixum* on account of the gradually acuminate leaves, as well represented by Rheede Roxburgh's drawing named *C asiaticum* (No 1395) is clearly this and not his *asiaticum* (*defixum*) Herbert suggests the union of the two under the name of ' Ditch crinum," both being marsh plants with fusiform stoloniferous caudices, forming prolongations of the base of the bulb

4 **C. Wattii,** *Baker Handb of Amaryllid* 76, leaves 18 by 1-1¼ in flaccid, scape 1½ ft rather stout, umbel 6-8 fld spathes deltoidly lanceolate, pedicels very short, perianth tube 3 in very slender lobes half as long, stamens equalling the lobes

MUNNIPORE, alt 4000 ft, in grassy places *Watt*

Bulb ovoid, 2 in diam, neck very short *Anthers* ½ in —A very obscure species, it is difficult in dried specimens to determine whether the corolla lobes are linear as in Sect *Stenaster*, or lanceolate as in Sect *Platyaster*

[illegible] **C.** [illegible] *Gard Chron* 1881 786, *Handb of* [illegible] ear flaccid, scape very slender [illegible] olate pedicels ¼ in, perianth [illegible] or longer Crinum sp *Wall Cat* [illegible]

BURMA, at Tavoy *Gomez*

Known only from Wallich's specimen, but Clarke has very similar plants from Silhet, Chota Nagpur and Bengal except in that their perianth-lobes are decidedly lanceolate, as indeed I should be disposed to consider the perianth-lobes of Wallich's to be, rather than linear

6 **C. latifolia**, *Dryand in Ait Hort Kew*, Ed 2, ii. 253, poly
labrous or
ile in an
e perianth
stigmas 3
Bot Reg
l Ind ii
146, *Lodd Bot Cab* t 113, *Wight Ic* t 2042 Molineria sumatrana, *Herb Amaryllid* 84 M latifolia & plicata, *Kurz in Ann Mus Lugd Bat* iv 176

Burma, the Malay Peninsula and Andaman Islands—Distrib Malay Islands

Rootstock hardly any, base of stem stoloniferous *Leaves* 1–2 ft by 1½–2½ in, petiole 1 ft or less *Ovary* oblong or globose, stipes of male fl much longer than of the bisexual and more slender *Fruit* 1 in long, clavate or pyriform, hairy *Seeds* black, shining (granular in Wight's figure)

There are four principal forms —1 Leaves 1½–2 ft by 4–5 in sparsely villous beneath, petiole slender, flowers small in a dense ovoid head (Singapore, Java) — 2 Leaves 1–1½ f
flowers larger ½
1–1½ ft by 1½ 2
Malacca) —4 [illegible] quite glabrous, longer than their petioles
y stout,
ill Cat

3 CRINUM, *Linn*

Rootstock bulbous *Leaves* elongate, lorate or ensiform *Scape* solid *Flowers* large, umbelled spathes 2 bracts linear *Perianth* funnel or salver-shaped tube straight or upcurved, lobes linear to oblong *Stamens* on the throat of the perianth erect spreading or declinate, anthers linear, dorsifixed *Style* filiform, stigma minute, ovules few or many *Fruit* subglobose, membranous or coriaceous bursting irregularly *Seeds* few large, rounded, testa thick albumen very copious —Species about 60, tropical Asiatic, African Australian and American

The identification by herbarium specimens of this genus is impossible, and I have little confidence in the following attempt to systematize the Indian ones, in which I have been guided by Herbert and Baker

Sect I Stenaster *Perianth* erect, salver shaped, lobes linear *Stamens* very long spreading

1 **C. asiaticum**, *Linn Sp Pl* 419 (*in part*), leaves very many 3–4 ft by 5–7 in flat scape 1½–2 ft compressed spathes 3–4 in umbels 10–50-fl, pedicels ½–1 in, perianth tube 3–4 in, lobes as long much longer than the filaments *Kunth Enum* v 547, *Baker Handb of Amaryllid* 7[illegible], *Herb Amaryllid* 21, *Dal & Gibs B mb Fl* 275, *Bot Mag* t. 1073, *Wall Cat* [illegible] in part [illegible] C toxicarium, *Roxb Fl Ind* ii [illegible], *Wight Ic* t 2021–2, *Lodd Bot Cab* t. 6[illegible] Amaryllis carnosa, *Herb Hm*

Throughout Tropical India, wild or cultivated Ceylon; common on the coast, *Thwaites*

Bulb very large, neck 4 5 in *Leaves* thin, edges smooth *Scape* often 1 in diam, sheaths thick *Flowers* white, fragrant at night, tube greenish; lobes revo-

lute *Stamens* often reddish, anthers ½–¾ in *Fruit* subglobose, usually 1-seeded.—Much the largest Indian species

Var *procera*, Baker l c, leaves 5 ft by 6 in, perianth-tube and lobes each 5 in, the latter tinged with red C procerum, *Carey ex Herb* in Lot. Mag t 2681

2 **C. defixum,** *Ker in Quart Journ Sci* iii (1817), 105, leaves few 2–3 ft by ¾–1 in erect linear obtuse concave, scape 1½–2 ft stout, umbels white, tube 2½–3 in, ich longer than the 2, *Bot Mag* t. 22 C asiaticum, *Roxb* rt C asiaticum var angustifolium, *Wall Cat* 8969 G, H Amaryllis vivipara, *Lamk Encyc* t. 123 A cœnosa, *Herb Ham*

Swampy river banks throughout INDIA ? CEYLON, in the hotter drier regions *Thwaites*

vers sessile, fragrant *Fruit* subglobose,

3 **C. ensifolium,** *Roxb Fl Ind* ii 129, leaves erect 12–18 by 1–1½ in ensiform tapering to the acuminate tip concave, scape rather slender umbels 10–12 fld, spathes 1½ 2 in, perianth white tube

Malab xi t 38

Banks of the DECCAN rivers PEGU *Care*

I follow Roxburgh and Herbert in keeping this distinct from *depxum* on account of the gradually acuminate leaves as well represented by Rheede Roxburgh's drawing named *C asiaticum* (No 1395) is clearly this and not his asiaticum (*depxum*) Herbert suggests the union of the two under the name of "Ditch crinum," both being marsh plants with fusiform stoloniferous caudices forming prolongations of the base of the bulb

in grassy places Watt

½ in —A very obscure species the corolla lobes are linear as ter

5 **C. stenophyllum,** *Baker in Gard Chron* 1881, 786, *Handb of Amaryllid* 75, leaves 3 ft by ¼–½ in linear flaccid, scape very slender 2 edged, umbel 4–6 fld, spathes 2 in lanceolate, pedicels ¼ in, perianth-tube 3–4 in very slender, lobes half as long or longer Crinum sp *Wall Cat* 8970

BURMA, at Tavoy, *Gomez*

very similar plants from th-lobes are decided anth lobes of Wallich

linear, es much ch more bright,

anthers brown

Sect IV BRACHYNEMA *Perianth* nodding, funnel shaped, lobes oblong *Stamens* erect, filaments shorter than the anthers.

12 **C. brachynema,** *Herb in Bot Reg* 1842, *Misc* 36, leaves 1½–2 ft by 3–4 in broadly lorate margins smooth, scape 12 in umbels 15–20 fld spathes lanceolate flowers pedicelled, perianth tube 1½–2 in, lobes 2 by , in many times longer than the stamens *Bot Mag t* 5937, *Flore des Serres t* 2303, *Baker Handb of Amaryllid* 88

The CONCAN *Woodrow, Stocks*

Bulb as large as the fist, ovoid neck very short *Leaves* produced long after flowering concave not keeled. *Scape* 8–12 in, spathes greenish *Flowers* fragrant, white, anthers yellow, style short included in the tube

DOUBTFUL SPECIES

C BREVIFOLIUM var *a*, Hort Beng, *C bracteatum* Bot Reg t 179, Herb in Bot Mag under t 2121 f 4 From Sundeep near Chittagong —Roxburgh's *C brevifolium* (Fl Ind ii 129, introduced into the Calcutta Gardens from the Mauritius) is a native of the Seychelles according to Baker and referable to *C bracteatum* Willd, and to *asiaticum*, var *bracteatum* Herb, it is a *Stenaster* with lorate leaves 1 1½ ft by 3 4 in broad with crisped margins, scape much compressed 10 20-fld perianth-tube slender 2½–3 in, lobes white cells of ovary 1-ovuled Specimens of any Sundeep *Crinum* should be procured for the determination of this plant

C CANALICULATUM *Herb in Bot Mag under t* 2121 *Amaryllid* 258 (C canaliculatum *Carey no Roxb*) is altogether doubtful (See under 10 *pratense*)

C ERYTHROPHYLLUM *Carey mss ex Herb in Bot Mag sub t* 2121, *Amaryllid* 250), from Pegu with deep blood red leaves, is mentioned by Herbert as having been cultivated in Calcutta by Carey, but lost before flowering

[illegible]

C (Stenaster) PEDUNCULATUM *Br Prodr* 297 *Bot Reg t* 52; *Bury Hexand Pl t* ii *Herb Amaryllid* 246; *Baker Handb of Amaryllid* 77 This Australian species probably occurs in the Malay Islands and Peninsula A leafless *Crinum* from Penang (Curtis, No 1274) and Wallich's *C asiaticum* 8069 D from Finlayson (Siam ?) strongly resemble it It differs from *C asiaticum* only in the long pedicelled flowers and according to the Bot Reg in the elongated rootstock Bentham (Fl Austral vi 455) doubts the Bot Reg plant being the true *pedunculatum*, and suspects that the true is only *C asiaticum* (as do I)

[illegible] *Amaryllid* ... (Bulb small ... mar... smooth scape twice as ... in, perianth tube about 5 in ... than the red filaments —Ceylon, ... to the American *Platyasteres*; it [illegible]

C UMBELLATUM *Carey ex Herb in Bot Mag l c* —Of this Herbert says that it is perhaps a small var of *C brevifolium*

4 PANCRATIUM, *Linn*

Rootstock bulbous *Leaves* often bifarious, linear or lanceolate *Scape* solid *Flowers* large umbelled or solitary, spathes 1-2 membranous, bracts few, linear, hyaline *Perianth* funnel shaped, tube long or short, united by xed *Style* l *Capsule* ar black —

* *Perianth tube* 1½-2 *in* *Staminal cup small —Bulb without a neck*

1 P. th tube *Baker* *l* 206 *Hort* *Mal.* xi t 40

BENGAL, *Roxburgh* DECCAN PENINSULA, Canara CEYLON, *Thwaites*

Bulb globose, 1½-2 in diam, neck 0 *Leaves* not bifarious, 8 12 by ½-¾ in, lanceolate acute *Scape* 6-9 in slender, spathe single, ovate, acute, pedicels very short *Flowers* fragrant, tube 1½ 2 in throat dilated, lobes ¾-1 in, staminal cup ¼ in diam, with 2 fid teeth between the short filaments

2 **P. zeylanicum,** *Linn Sp Pl* 290, scape 1 fld perianth tube as long as the lanceolate lobes or shorter, throat broadly funnel shaped, filaments much longer than the broad shallow 12 toothed cup *Kunth Enum* v 662, *Roxb Fl Ind* ii 124 *Thwaites Enum* 324, *Wall Cat.* 8973 A, *Baker Handb of Amaryllid* 118, *Bot Reg* t 479, *Bot Mag* t 2538 P tiaraeflorum, *Salisb Par Lond* t 86

TROPICAL ASIA and CEYLON —DISTRIB Malay Archipelago

Bulb globose 1½ 2 in diam, neck 0 *Leaves* 8-12, bifarious, 6-11 in, linear-lanceolate acuminate *Scape* shorter than the leaves, spathes as long as the corolla tube *Flowers* sessile white, fragrant, 2-3 in diam, cup broad, sub-equally 12-toothed teeth large, filaments 1-1½ in longer than the cup, anthers ¼ in

** *Perianth tube* 3-4 *in* *Staminal cup broad —Bulb with a long neck*

3 **P. verecundum,** *Ait Hort Kew*, i 412, scape stout about e longer 2-6 fld, spathes 2, filaments r *Kunth Enum* v 661, *Bot Reg* t *Handb of Amaryllid* 119 (excl syn

description is from Baker

4 **P. biflorum,** *Roxb Fl Ind* ii 125, scape 2-3 fld, perianth tube slender trigonous as long as the linear lobes, throat not dilated, filaments about as long as the funnel shaped erose cup ? P longiflorum, *Herb Amaryllid* 208, t 42, f 2

anthers brown

Sect IV BRACHYNEMA *Perianth* nodding, funnel shaped, lobes oblong *Stamens* erect, filaments shorter than the anthers.

12 **C. brachynema,** *Herb in Bot Reg* 1842, *Misc* 36, leaves 1½–2 ft by 3–4 in broadly lorate margins smooth, scape 12 in, umbels 15–20 fld spathes lanceolate flowers pedicelled, perianth-tube 1½–2 in, lobes 2 by ¾ in many times longer than the stamens *Bot Mag t* 5937, *Flore des Serres* t 2303 *Baker Handb of Amaryll* 88

The CONCAN *Woodrow* *Stocks*

Bulb as large as the fist, ovoid neck very short *Leaves* produced long after flowering concave not keeled *Scape* 8 12 in, spathes greenish *Flowers* fragrant, white; anthers yellow, style short included in the tube

DOUBTFUL SPECIES

C BREVIFOLIUM, var *a*, Hort Beng, *C bracteatum* Bot Reg t 179, Herb in Bot Mag under t 2121 f 4 From Sundeep near Chittagong —Roxburgh's *C brevifolium* (Fl Ind ii 129 introduced into the Calcutta Gardens from the

plant

C CANALIFOLIUM *Herb in Bot Mag under* t 2121 *Amaryll* 258 (C canaliculatum *Carey* not *Roxb*) is altogether doubtful (See under 10 *pratense*)

C ERYTHROPHYLLUM *Carey mss ex Herb in Bot Mag sub* t 2121, *Amaryllid* 259), from Rangoon with deep blood red leaves, is mentioned by Herbert as having been cultivated in Calcutta by Carey, but lost before flowering

C (Platyaster) STRICTUM, *Herb in Bot Mag l c* and t 2365, *Amaryllid* 253, 401, *Baker l c* 86 (C Herb rtinum *Schult Syst* vii 871), bulb small

C UMBELLATUM, *Carey ex Herb in Bot Mag l c* —Of this Herbert says that it is perhaps a small var of *C brevifolium*

4 PANCRATIUM, Linn

Rootstock bulbous *Leaves* often bifarious linear or lanceolate *Scape* solid *Flowers* large, umbelled or solitary, spathes 1-2, membranous, bracts few, linear, hyaline *Perianth* funnel shaped, tube long or short, lobes narrow *Stamens* on the throat of the perianth, filaments united by a toothed or lobed membrane forming a cup, anthers dorsifixed *Style* filiform stigma small, ovules many superposed in each cell *Capsule* large, subglobosely 3 angled, loculicidal *Seeds* angled, testa lax black — Species about 12 S European, Indian and African

* *Perianth tube* 1½-2 in *Staminal cup small —Bulb without a neck*

1 **P. triflorum,** *Roxb Fl Ind* ii 126, scap
longer t
Handb
Crinum
Mal xi t 40

BENGAL, *Roxburgh* DECCAN PENINSULA Canara
Bulb globose, 1½-2 in diam neck 0 *Leaves* not lanceolate acute *Scape* 6-9 in slender, spathe single, short *Flowers* fragrant, tube 1½ 2 in throat dilate cup ¼ in diam, with 2-fid teeth between the short f lam

2 **P. zeylanicum,** *Linn Sp Pl* 290, scape long as the lanceolate lobes or shorter throat filaments much longer than the broad shallow *Enum* v 662, *Roxb Fl Ind* ii 124 *Thwaites*. 8973 A, *Paley Handb cf Amaryllid* 118, *I t* t 2538 P tiaraeflorum, *Salisb Par Lond* t 80

TROPICAL ASIA and CEYLON —DISTRIB Malay Archi
Bulb globose 1½ 2 in diam, neck 0 *Leaves* 8 12 lanceolate acuminate *Scape* shorter than the leaves corolla tube *Flowers* sessile white, fragrant 2-3 in equally 12 toothed teeth large, filaments 1 1¼ in long ¼ in

** *Perianth tube* 3-4 in *Staminal cup broad*

3 **P. verecundum,** *Ait Hort Kew* i 4 equalling the oblanceolate leaves or longer 2-6 fl much longer than the teeth of the cup *Kunth* I t. 113, *Herb Amaryllid* 206, *Baker Handb cf Wight*)

Foot of the HIMALAYA, from the Panjab eastwards to
Bulb globose, 2 in diam, neck cylindric *Leaves* nate *Scape* 12 in, compressed; spathes lanceolate, tube 3-4 in, throat obconic, lobes 1½ in linear stamin with a bifid tooth between the filaments style longer th description is from Baker

4 **P. biflorum,** *Roxb Fl Ind* ii 125, scap slender trigonous as long as the linear lobes, throa about as long as the funnel shaped erose cup *Amaryllid* 208, t 42, f 2

inner largest broadly oblong *Roxb Cor Pl* t 257 T aspera *Roxb Fl Ind* ii 169 Atacca integrifolia *Presl Rel Haenk* 149, *Flore des Serres*, t 860 861

SILHET CHITTAGONG and TENASSERIM

4 **T. lævis,** *Roxb Fl Ind* ii 171 leaves entire elliptic ovate petiole and short recurved scape smooth invol. leaves 4 subequal sessile ovate acuminate perianth lobes spreading acute 3 inner largest and broadest *Gr h Cat Bomb Pl* 230 *Kunth Enum* v 466 T integrifolia *Herb Hort*

BHOTAN HIMALAYA *Griffith* SILHET *Roxburgh* CHITTAGONG MUNNIPORE, and TENASSERIM S CONCAN *Nimmo*—DISTRIB Tonk n Java

Rootstock subcylindric *Leaves* 12 16 by 5 6 in acuminate, petiole as long as the blade *Scape* shorter than the petiole greenish purple more or less recurved 6–12 fld invol leaves 2 by 1 in finely acuminate many nerved bracts numerous filiform *Flowers* pedicelled bluish greenish grey or violet perianth ¾ 1 in diam outer lobes acute

ORDER CLIV DIOSCOREACEÆ

Rootstock various *Stem* climbing branched rarely short erect *Leaves* entire lobed or digitately 3–5 foliolate costate and reticulate petiole often angular and twisted at the base *Flowers* small or minute panicled racemose or spicate rarely bisexual *Perianth* superior 6 cleft *Male fl*

… Fem … uetrous … ovules 2 … *Fruit* … ncluded

Climbers flowers unisexual capsule 3 winged 1 DIOSCOREA
Stem erect 1 leaved flowers bisexual fruit indehiscent 2 TRICHOPUS

1 DIOSCOREA, *Linn*

Fruit capsular —Species 150 tropical and subtropical

by me may have other earlier names in Malayan Flora than I have given, but the Malayan species are even more loosely described than the Indian The Wallichian collection is very complete, but the species are often mixed

A Leaves 3–5 foliolate Capsule in all oblong Seeds winged at the top

SECT I *Stamens* 6, all antheriferous *Pistillode* low, broad

1 **D. dæmona,** *Roxb Fl Ind* iii 805, *Wight Ic* t 811 D virosa, *Wall Cat* 5099, *Kunth Enum* v 413 D triphylla *Herb Ham* D altissima *Herb Roxb* D trinervia *Roxb ex Wall Cat* 5099 D amœna, *Roxb ex Wight* (*error*, for dæmona) D hirsuta *Dennst Schluess Hort Mal* 33 Helmia? dæmona, *Kunth l c* 439 Smilax? narcotica & virosa, *Herb Ham ex Wall Cat*—*Rheede Hort Mal* vii t 51, 52

Tropical forests throughout INDIA BURMA, and the MALAY PENINSULA — DISTRIB Malay Islands, Tonkin

petals, anthers subsessile male *Capsule* 2 2½ by the oblong wing broader ferring Rumph s Ubium

Var *reticulata*, leaves finely reticulate beneath male racemes much branched, capsule tomentose D microcarpa *Wall Cat* 5100

SECT II *Stamens* 3 antheriferous alternating with 3 staminodes *Pistillode* columnar

2 **D. tomentosa,** *Heyne ex Roth Nov Pl Sp* 371 leaves 3–5-foliolate softly tomentose beneath bracts shorter than the flower *Roxb Fl Ind* iii 805 *Wall Cat* 5001 D triphylla *Herb Russ* Helmia tomentosa *Kunth Enum* v 431

3 **D. pentaphylla,** *Linn Sp Pl* 1032, leaves 3–5-foliolate glabrous or sparsely pubescent beneath bracts shorter than the flowers *Roxb Fl Ind* iii 806, *Wight Ic* t 814 *Wall Cat* 5008 *Thwaites Enum* 32?, *Kunth Enum* 396 *Dal & Gibs Bomb Fl* 247 D triphylla *Linn l c*, *Wall Cat* 5702 *Dal & Gibs l c*, *Jacq Ic* t 627 *Coll* ii 365, *Kunth* D lunata *Roth Nov Pl Sp* 370 Botryosicyos pentaphyllus *Hochst* phylla *Salisb Gen Pl Fragm* 12

Throughout tropical India, from Kumaon in the N.W. HIMALAYA eastward to BURMA, and southward to CEYLON and MALACCA. DISTRIB. Malay Hills, Afr trop

Tubers oblong (5–6 ft., *Ic Thwaites*) *Stem* slender, prickly at the base, rarely above, often bulbiferous *Leaves* as in *D tomentosa*, but never softly tomentose, obovate, acuminate or cuspidate *Male panicles* and flowers glabrous hispidly pubescent or villous, spikes lax or dense-fld, flowers sessile or pedicelled, $\frac{1}{16}$–$\frac{1}{12}$ in. diam. fragrant, filaments and staminodes very short *Capsule* $\frac{3}{4}$–1 in, rounded at both ends or base cordate and tip apiculate, glabrous or pubescent. *Seeds* $\frac{1}{2}$–$\frac{1}{3}$ in, wing broader than the nucleus—I cannot separate the glabrous tomentose and villous flowered plants, or the sessile- from the pedicelled flowered. A fruiting Bombay specimen from Ritchie has almost woolly capsules cordate at the base, and with a strong short beak at the retuse apex.

4 **D. kumaonensis,** *Kunth Enum* v. 395, leaves 3–5-foliolate nearly glabrous or sparsely hairy beneath, bracts long-acuminate longer than the flowers D pentaphylla, *Wall. Cat* 5098 E. D triphylla, *Wall Cat* 5702 B F Vitis, *Wall Cat* 9032

TEMPERATE HIMALAYA alt 4–6000 ft [illegible] The KHASIA and MUNNEPOR

Very near *D* [illegible] more slender, with pisiform [illegible] with long setaceous points, larger longer more pointed bracts, larger flowers $\frac{1}{12}$–$\frac{1}{10}$ in diam, longer staminodes and pistillode; but there are Garwhal specimens from Edgeworth with bracts as short and flowers as small as in *pentaphylla* *Capsule* $\frac{3}{4}$ in oblong, rounded at both ends—A state occurs in both the Himalaya and Khasia with a much-branched panicle bearing imperfect long-pedicelled flowers with very narrow quite glabrous sepals and petals, abortive anthers, and sometimes a large imperfect stigma, the bracts in this are at the base of the pedicel which is an imperfect ovary

5 **D. Jacquemontii,** *Hook f*, leaves 3–5-foliolate, leaflets finely acuminate glabrous, flowers much larger than in *D pentaphylla* glabrous and short bracts both streaked with brown.

The CONCAN, between Poona and Carli, *Jacquemont*, Belgaum, *Ritchie*.

Closely allied to *D pentaphylla*, but besides the above differences, the stamens, staminodes and pistillodes are all much longer.

B Leaves simple

SECT III. *Sepals* broadly oblong or orbicular *Stamens* 3, antheriferous, anther cells remote on the arms of a forked connective

6 **D. Collettii,** *Hook f*—Diosc. sp indescript, *Collett & Hemsl. in Journ Linn Soc* xxviii 137

BURMA, Shan Hills, alt 4000 ft, *Collett*

Quite glabrous *Branches* slender, terete, unarmed. *Leaves*, largest 4–5 by 3–3½ in, broadly ovate-cordate, acuminate, 7–9 nerved from the deeply 2 lobed base, membranous, reticulate, basal lobes rounded, petiole slender *Male spikes* axillary, solitary, longer than the leaves very slender, flowers [illegible] clusters, bracts very [illegible] petals flat, with roun[illegible] from the minute 3-to[illegible] globose—Dries black [illegible] anther-cells.

SECT. IV. *Sepals* broadly oblong or orbicular *Stamens* 6, antheri-

ferous (except *D decipiens*), anther-cells combined *Capsule* (where known) broader than long. *Seeds* orbicular, broadly winged all round

* Male flowers in long simple or nearly simple axillary spikes, distant, or in distant clusters.

7. **D. spinosa,** *Roxb ex Wall Cat* 5703 A, B, C, E, F, glabrous or

viii t 52 —*Rumph Amb* v t 126

TROPICAL INDIA, CEYLON, BURMA and the MALAY PENINSULA, *cultivated* — DISTRIB Trop America

pedicelled, bracteoles very broad, perianth segments remote from the large oblong pistillode; anthers large *Fem raceme* rather short *Capsule* 1 in diam, broadly obcordate —I cannot adopt Roxburgh's name of *aculeata* for this for it is not

8 **D. deltoidea,** *Wall Cat* 5110, nearly glabrous, leaves hastately or subdeltoidly cordate acuminate 7–9-nerved, perianth sub-rotate, pistillode minute *Kunth Enum* v 340

TEMPERATE HIMALAYA from Kishmir to Bhotan alt 6–1000 ft KHASIA HILLS, alt 4–5000 ft —DISTRIB Affghanistan

Branches very slender, terete unarmed *Leaves* attaining 7 by 5 in, membranous, reticulate beneath, very variable in breadth and depth of lobing lobes rounded or subangular, sometimes dilated outward, petiole 2 5 in, very slender

clustered

Capsule

rdate, base

variable in

form, winged all round or on one side —I hesitate to unite with this the Burmese plant referred to it by Hemsley and Collett (Journ Linn. Soc. xxviii 137) which is too imperfect for determination

9 **D. Wightii,** *Hook f*, quite glabrous, leaves ovate-cordate acuminate 7-nerved, perianth segments erect, pistillode minute

TRAVANCORE, Courtallum, *Wight*

In habit and foliage very like *D deltoidea* but the flowers are always solitary sessile by a broad base, the filaments much longer and the anthers large and oblong —Only one specimen seen

10 **D. spicata,** *Roth Pl Nov* 571, quite glabrous, leaves alternate shortly petioled linear-oblong or lanceolate 3-rarely 5 nerved finely reticulate beneath, flowers globose, pistillode large conical *Kunth Enum* vi. 399, *Thwaites Enum* 326

INDIA, *Heyne* CEYLON, *Walker, &c*

Branches very slender, terete, unarmed *Leaves* 2 4 by ¾-2 in , obtusely acuminate, thin obscurely margined, base cuneate or rounded rarely subcordate *Male spikes* 3-8 in , rarely branched , bracts ovate , flowers $\frac{1}{12}$ in diam., solitary, sessile, ...ier slender, anthers didy ...op and bottom, glabrous, ...in referring the Ceylon ...of which I have seen no ...2302) in Herb Kew are ...error probably arises from

** Male spikes whorled in axillary and terminal panicles

† Leaves cuneate or rounded at the base, rarely retuse never deeply cordate

§ *Leaves more or less pubescent beneath, or glabrous in* D oppositifolia

11 **D. pyrifolia,** *Kunth Enum* v 384 leaves mostly opposite orbicular or broadly oblong 5 nerved coriaceous more or less finely (not stellately) pubescent beneath male spikes 1-1½ in spreading, anthers subsessile pistillode minute

TENASSERIM *Helfer* (*Kew distrib* 5538) SINGAPORE *Wallich* MALACCA (not Philippine Islands), *Cuming* (No 2314) *Griffith* (*K d* 5562) *Maingay* (*K d* 1705), *Hervey*

Branches terete, glabrous or puberulous *Leaves* 2 4 by 1½-3 in , acuminate or cuspidate, base rounded or retuse, reticulate beneath petiole ½-1 in *Spikes* glabrous, flowers $\frac{1}{16}$-$\frac{1}{12}$ in diam globose, sepals orbicular oblong, petals cuneate-obovate, anthers very small *Capsule* broader than long cordate at base and top *Seeds* ½-1 in diam —Kunth erred in assuming this to be one of Cuming's Philippine plants

12 **D. orbiculata,** *Hook in Herb* , leaves mostly opposite orbicular 5-nerved stellately pubescent towards the base beneath, male spikes 1½ 2 in spreading flowers very minute, anthers subsessile, pistillode minute D sativa *Wall Cat* 5108 C

PENANG , *Philipp* , on Govt Hill, *Curtis*

Very near *D pyrifolia*, but the leaves are smaller not coriaceous, and at once distinguished by the stellate hairs beneath the petals also are elliptic —Fem fl and fruit unknown

13 **D. oppositifolia,** *Linn Sp Pl* 1033, glabrous or sparsely ...ite ...a ...ier ...el ...ra ...b

Heyne D coriacea, *Herb Wight*

1½ 2½ in diam , retuse or almost 2 lobed at the top, coriaceous, glabrous *Seeds* ...-1½ in diam , wing very broad

14 **D. decipiens,** *Hook f*, orbicular finely pubescent beneath s nous male spikes short as in D staminodes on the petals D glabra

BURMA at Prome and Taongdong *Wallich*; Upper Burma *Collett*

Resembles *D oppositifolia* so closely that an exam nation of very many flowers of both species was necessary to determine me to regard it as a species it has also hitherto occurred in a d fferent geographical area being confined to Burma where *D oppositifolia* has not been collected

§§ *Leaves perfectly glab ous on both surfaces* (*see also* 13 oppositifolia)

15 **D laurifolia,** *Wall Cat* 5111 very slender, leaves linear or narrowly oblong lanceolate obtusely acuminate 3 nerved strongly reticulate beneath male spikes very slender deflexed flowers very minute pistillode minute D glabra *Wall Cat* 5105 B

PENANG, *Porter Maingay* (*Kew distrib* 1701) *Hullett*

Leaves 3–4½ by ¾ 1½ in oppos te and alternate rather st ff base rounded or cuneate pet ole ½ 1 in very slender *Male spikes* 1½ 2½ in long elongate uni lateral panicles sol tary or 2 4 nate p ndulous flowers $\frac{1}{16}$ in d am scattered sepals broadly oblong petals smaller oblong anthers rather large fla ne ts short Fruit unknown

Var ? More robust leaves shorter ell pt c more cor aceous male sp kes stouter very densely whorled in st ffer panicles flowers larger g bbous at the base Fem fl in large branched green glabrous pan cles —Malacca *Gr ff th* (*Kew distrib* 5556)

16 **D. deflexa,** *Hook f* leaves chiefly opposite ovate oblong acu minate 5 nerved base rounded or obscurely cordate male spikes 1 1½ in sto it deflexed anthers large pistillode large

SINGAPORE and MALACCA *Mai gay* (*Kew di trib* 1705 1706)

Branches rather stout terete *Leaves* 4 5 by 1½ 3 in strongly coriaceous marg n not thickened or cart lag nous petiole 1 1½ in *Male spikes* deflexed from the base flowers globose about $\frac{1}{12}$ in d am sepals broadly ovate petals oblong

not

D. [illegible] s opposite cuneately very slender male nicles flowers very

CEYLON

Branches terete *Leaves* 2 by 1 1½ in very th n and pale when dry very et ole ½ in. *Male spikes* attered globose sessile ian Herbarium marked or collector s name, I all resembling it in the

†† Leaves cordate hastate or broadly truncate at the base

18 **D. anguina,** *Roxb Fl Ind* iii 803 softly tomentose leaves opposite and alternate large long petioled broadly ovate or orbicular

cordate 7 nerved margin cartilaginous, male spikes short dense fld spreading, pistillode large globose. D spinosa, *Wall Cat* 5103 G, H

TROPICAL HIMALAYA, from Nepal, *Wallich*, to Bhotan (*Kew distrib* 5518) ASSAM, SILHET CACHAR, BENGAL, CHOTA NAGPORE

Tubers columnar (*Roxb*) *Leaves* 3-5 by 2-5 in, rather thick, nerves strong beneath, nervules transverse, petiole 1½-3 in *Male panicles* stout, spikes crowded, densely tomentose flowers $\frac{1}{16}$ in diam, sepals and petals very broad, anthers large *Capsule* ¾-1½ in diam, cordate at the top and base *Seed* orbicular

19 **D. polyclades,** *Hook f*, stems slender and leaves beneath and inflorescence tomentosely pubescent, leaves opposite and alternate orbicular or ovate cordate apiculate 5 costate, male spikes ½-1 in 5-6 nately whorled in long panicles flowers minute crowded D nummularia, *Kunth Enum* vi. 386 (*excl syn*), *Moritz Syst Verz Zolling Pflanz* 92 (*not of Lamk*)

SINGAPORE, *Ridley* —DISTRIB Java

Stem terete *Leaves* 3-4 by 2-2½ in, orbicular cordate in the Singapore plant, ovate cordate in the Javan opaque above, brown when dry, softly finely tomentose and laxly reticulate beneath, petiole 1-1½ in, slender *Male panicles* 6-10 in, terminal compound, whorls of spikes very numerous, sessile or shortly pedicelled, [illegible] — A very distinct species [illegible] it the plant figured by [illegible] is described as having [illegible] im Plant Jav 22) as [illegible] ink certainly Zollinger's

20 **D. glabra,** [illegible]

[illegible]

Herb Ham

SUBTROPICAL HIMALAYA alt 3-5000 ft, from Simla to Sikkim and southwards to BENGAL, BEHAR the CONCAN BURMA and the MALAY PENINSULA

Stems stout somewhat flattened (*Roxb*) *Leaves* extremely variable 3-8 by [illegible] e or deeply [illegible] thickened or [illegible] rs scattered, [illegible] diam, very [illegible] the tip and

[illegible]

D. [illegible] ler, leaves [illegible] e or sub- [illegible] panicles [illegible] le obscure

PENANG, *Wallich*

Branches terete *Leaves* 3-4 by 1½-2 in, not margined, nervules indistinct, petiole ½-1 in *Male spikes* ¾ in, rachis very slender, flowers $\frac{1}{18}$ in diam, sessile, with a boss at the broad base on the side opposite to the bracts

22 **D. Wallichii,** *Hook f*, quite glabrous, leaves opposite long petioled ovate or orbicular cordate 7-nerved, male spikes 1 in in short axillary and terminal spreading panicles, flowers globosely 3 lobed, stamens short, pistillode large globose D sativa, *Herb Madr in Wall Cat* 5708, A, B, F, D ? D nummularia *Willd ex Roxb Fl Ind* iii 803

SILHET, CACHAR, MUNNEPORE and BURMA, common CHOTA NAGPORE *Clarke* TRAVANCORE, *Herb Madr* (Cult ?)

Branches stout, terete *Leaves* 3–6 in, as broad always broadly cordate with rounded sides and a broad sinus, very finely reticulate beneath, petiole 3 5 in
petals suborbicular, stamens inserted under
1½ in diam, emarginate at the tip *Seeds*
broad rounded long petioled glabrous leaves

Sect V *Sepals* orbicular *Stamen* 6 antheriferous, anther cells combined *Capsule* longer than broad. *Seeds* laterally winged

23 **D. Hamiltoni,** *Hook f*, quite glabrous stem angled or slightly winged, leaves cordately or subhastately ovate or lanceolate 7–9 nerved, male spikes ½ in rachis very slender zigzag stamens very short pistillode obscure D sativa, *Wall Cat* 5108 D aculeata *Wight Ic* t 2060 D alata *Griseb Fl Brit W Ind* 587 D incrassata and ovata *Herb Ham*

SIKKIM, ASSAM, CACHAR BEHAR CHOTA NAGPORE MALABAR and BURMA, in all ? cultivated —DISTRIB St Domingo (cult)

Branches slender *Leaves* opposite and alternate undistinguishable from those of *D glabra*, petiole 1 2½ in *Male spikes* whorled on the branches of very slender

Sect VI *Sepals* narrow, subvalvate, linear or linear lanceolate *Capsule* oblong *Seeds* winged laterally

24 **D. sativa,** *Linn Sp Pl* 1033 (*excl syn Rheede*), *Hort Cliff*

Roxb Fl Ind iii 801–804 D decemangularis *and* D Tunga, *Herb Ham.* Helmia bulbifera, *Kunth Enum* v 135

dulymous *Fem spikes* 4 10 in. long pendulous, flowers ⅛–¼ in long, sepals as in the male *Capsule* ¾–1 by ½–¾ in, membranous *Seeds* with a broad basal wing — I follow Bentham in regarding this as Linnæus's *sativa*, an inspection of the plant in 'Hortus Cliffortianus,' which is Linnæus's authority for the species, confirming this

view In Sp Plant he cites for *sativa* also Rheede's plate of *D aculeata*, to which Kunth and others have confined the name Lamk Encycl iii 232, gives the name *D Cliffortiana* to Linnæus's plant, but figures (Ill t 818) a very different one for it rejecting the name *sativa* because he does not consider it to be the cultivated "igname" The difference in the size of the male flowers of *sativa* are so great that I have suspected that two species may be included, but I have failed to define them

Sect VII *Sepals* narrowly oblong or lanceolate sub valvate *Capsule* broader than long, carpels rounded *Seed* winged all round

25 **D. alata**, *Linn Sp Pl* 1033, quite glabrous, stem acutely ... or deeply cordate orbicular or ovate ... cled spikes *Kunth Enum* v 387, ... 10 D japonica, *Hb Madr in Wall* ... gula, *Ham in Wall Cat* 5109 D octangularis, Devipata & Bisantaca and Hurchusia, *Herb Ham* D odoratissima, *Wall mss* (*Ic in Herb Kew*) D angulifiora, *Steud Pl Hohenack exsicc* No 699 A D bulbifera, *Russ ex Wall Cat*

TROPICAL INDIA (cult ?)

IMPERFECTLY KNOWN AND UNDETERMINABLE SPECIES

D ACULEATA *Linn Sp Pl* 1033 The authority for this is Rheede's Katter Kelengu, vii 71, t 37 which is unrecognizable A knowledge of the Malabar languages might reveal it

D ANGULATA, *Roxb in Steud Nomencl* Ed ii i 511 I have found no other reference to this species

D ATROPURPUREA *Roxb Fl Ind* iii 800, tubers subrotund purple throughout, branches 4–7 winged, wings coloured and curled, leaves deeply cordate 5–7 nerved, petioles winged bases much enlarged and stem clasping —Cultivated in Malacca, Pegu and the Eastern Islands

D BULBIFERA *Linn Sp Pl* 1033, is in same category as *D aculeata*, it is Rheede s Katu Katsjit vii 69, t 36

D CRISPATA, *Roxb Fl Ind* iii 802, tubers rounded stem unarmed terete 10 15 winged wings curled leaves alternate broad cordate 7–11 nerved, petiole with curled wings, male spikes panicled fem pendulous perianth segments linear white —Interior of Bengal

D CYLINDRICA *Vitm S mm Pl* v 426 For this plant the author cites Rheede Hort Mal vii t 50 which is a Cucurbit

D FASCICULATA *Roxb Fl Ind* iii 801 tubers pendulous size of an egg attached by slender filaments white stem very slender, terete, prickles stipulary leaves alternate round cordate 3–7 nerved slightly villous —Cultivated near Calcutta

D GLOBOSA, *Roxb l c* 797; tubers large round white, stems 6 winged ... ensiform ... ikes com ... ry remote

D INTERMEDIA, *Thwaites Enum* 326, glabrous, unarmed, stem terete, leaves 3

near *D. spicata*, but has shorter spikes

D NEPALENSIS, *Sweet Hort Brit Ed* ii 522 No description

D PELTATA, Juss in Pers Syn ii 621, Kunth Enum vi 413, from Ceylon, is probably a *Cocculus*.

D PURPUREA, Roxb Fl Ind iii 799 tubers oblong reddish throughout, stems 6-, or more winged prickly, leaves opposite and alternate cordate 5–7-nerved, petiole long winged stem clasping Male and fem spikes as in *D rubella* — Cultivated in Bengal

D RUBELLA, *Roxb*
opposite sagittate corda
it simple shorter than
the leaves, flowers very
Cultivated about Calcutta

D SPICATA, Roth, var β Thwaites Enum 326 (C P 2872) a very slender plant with ovate caudate-acuminate leaves, and a short panicle of large broad orbicular cuspidate thin walled capsules is something I think entirely different from *D spicata* *Capsules* 1–1¼ in diam, valves semicircular *Seed* orbicular, ¾ in diam, broadly winged all round

2 TRICHOPUS, *Gærtn*

A small erect rigid, perennial herb *Stem* short *Leaf* terminal, petioled, linear lanceolate, ovate or triangular, 3 7 costate *Flowers* small, fascicled at the base of the leaf, panicles filiform, bisexual *Perianth* campanulate, subequally 6 fid *Stamens* 6 on the bases of the perianth lobes, anthers subsessile, short, broad, connective produced *Ovary* 3 celled, style very short stigmas 3, short, reflexed, 2 fid, ovules 2, superposed in each cell, anatropous *Fruit* ovoid, triquetrous, indehiscent *Seeds* oblong, rugose grooved dorsally testa thin embryo minute in a cartilaginous albumen

1 T. ZEYLANICUS, ... *Beccari in Nuov Giorn* ... ichopodium cordatum ... t 1543 T zeylanicus *Schnitzl in Bot Zeit* 1813, 739

TRAVANCORE, *Beddome* CEYLON common

Stem 1–3 in *Leaves* 2–3 in long, petiole 1–3 in *Pedicels* 1–3 in long *Flowers* minute, dark brown, perianth lobes lanceolate, acute *Fruit* ½ in long pedicel thickened at the top.

ORDER CLV ROXBURGHIACEÆ.

Rootstock tuberous or creeping, stem erect or climbing *Leaves* alternate or opposite, petioled 3 or more-costate cross nervules parallel *Flowers* in axillary peduncles regular bisexual *Perianth* superior or half superior, 2 seriately 4-cleft. *Stamens* 4 at the base of the perianth lobes or subhypogynous, anthers dorsifixed *Ovary* 1 celled stigma subsessile, or stigmas 2, ovules 2 or more erect from the base or pendulous from the top of the cell, anatropous *Capsule* 2 valved (fruit unknown in

igname The difference in the size of the male flowers of *sativa* are so great that I have suspected that two species may be included, but I have failed to define them

Sect VII *Sepals* narrowly oblong or lanceolate sub valvate *Capsule* broader than long, carpels rounded *Seed* winged all round

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TROPICAL INDIA (cult ?)
Roots very large ... tuberiferous var ... s te from orbicula ... and flowers as in *D* ... broader than long ... cular broadly wing ... young fruit only

IMPERFECTLY KNOWN AND UNDETERMINABLE SPECIES

D ACULEATA *Linn Sp Pl* 1033 The authority for this is Rheede's Katter Kelengu vii 71 t 37 which is unrecognizable A knowledge of the Malabar languages might reveal it

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D GLOBOSA, *Roxb l c* 797, tubers large round white stems 6 winged prickly towards the root ... ens form ... kes com ... ry remote

near *D spicata*, but has shorter spikes

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D RUBELLA, *Roxb l c* 798, tubers oblong red-skinned, stem 6 winged, leaves opposite sagittate cordate 3-7-nerved, male spikes axillary simple and compound, if simple shorter than the leaves, fem spikes axillary generally simple longer than the leaves, flowers very fragrant, staminodes large almost like the male stamens — Cultivated about Calcutta

D SPICATA, Roth, var *β* Thwaites Enum 326 (C P 2872) a very slender plant with ovate caudate acuminate leaves, and a short panicle of large broad orbicular cuspidate thin walled capsules is something I think entirely different from *D spicata* *Capsules* 1–1¼ in diam, valves semicircular *Seed* orbicular, ¾ in diam, broadly winged all round

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1 **T. zeylanicus,** *Gærtn fruct* 1 44, t 14 *Beccari in Nuov Giorn Bot Ital* ii 13, *Beddome Ic Pl Ind Or* t 290 Trichopodium cordatum intermedium and augustifolium, *Lindl Bot Reg sub* t 1543 T zeylanicum, *Thwaites Enum* 291, 443 Podianthus arifolius *Schnitzl in Bot Zeit* 1843, 739

TRAVANCORE, *Beddome* CEYLON common

Stem 1–3 in *Leaves* 2 8 in long, petiole 1–8 in *Pedicels* 1 3 in long *Flowers* minute, dark brown, perianth lobes lanceolate acute *Fruit* ½ in long pedicel thickened at the top.

ORDER CLV ROXBURGHIACEÆ.

Rootstock tuberous or creeping stem erect or climbing *Leaves* alternate or opposite, petioled 3 or more costate cross nervules parallel. *Flowers* in axillary peduncles, regular bisexual *Perianth* superior or half superior, 2 seriately 4-cleft. *Stamens* 4 at the base of the perianth lobes or sub hypogynous, anthers dorsifixed *Ovary* 1 celled, stigma subsessile, or stigmas 3, ovules 2 or more erect from the base or pendulous from the top of the cell anatropous *Capsule* 2 valved (fruit unknown in

Notulæ and no doubt *bootanense* is a misprint for *boolanense*, the plant being found near the Boolan pass

Series A *Rootstock* not bulbous *Anthers* bursting inwards *Fruit* a berry

Tribe I SMILACEÆ Shrubs *Stem* climbing *Leaves* 3–5-nerved and reticulately nerviled petiole often cirrhiferous *Flowers* small, in umbels *Anthers* after dehiscence 1 celled *Ovules* few, orthotropous or ½ anatropous

Perianth 6 partite	1 SMILAX.
Perianth ovoid or tubular mouth very minute	2 HETEROSMILAX

Tribe II ASPARAGEÆ *Stem* erect or climbing *Leaves* replaced by usually linear or acicular cladodes *Flowers* small, solitary, fascicled or racemed *Anthers* distinctly 2 celled *Ovules* few orthotropous or ½ anatropous 3 ASPARAGUS

Tribe III POLYGONATEÆ *Stem* herbaceous, unbranched, leafy *Flowers* axillary or in terminal racemes or panicles

Flowers axillary, perianth cylindric lobes short	4 POLYGONATUM
Flowers axillary, perianth rotate	5 STREPTOPUS
Flowers in terminal racemes or panicles, perianth 6 partite	6 SMILACINA

Tribe IV CONVALLARIEÆ Scapigerous herbs *Leaves* radical *Scape* lateral naked, bearing a unilateral raceme or spike *Stigma* small

Perianth subglobose, 6-partite	7 THEROPOGON

Tribe V ASPIDISTREÆ *Rootstock* very stout, creeping, stem very short *Leaves* radical coriaceous *Scape* very short axillary *Flowers* solitary or spicate *Perianth* subglobose fleshy *Fruit* a berry

Stigma large, peltate, spike many fld	8 TUPISTRA
Stigma small, 3 lobed, spike erect many fld	9 GONIOSCYPHA
Stigma large, peltate flower solitary	10 ASPIDISTRA

Series B *Rootstock* stout or a bulb *Leaves* radical or cauline *Anthers* dorsi or basi fixed *Ovules* anatropous *Fruit* usually loculicidal

Tribe VI HEMEROCALLEÆ *Leaves* linear radical *Flowers* large panicled racemed or spicate *Perianth* cylindric or funnel shaped *Filaments* inserted in a dorsal pit of the anther *Ovules* numerous

Flowers panicled erect perianth funnel shaped	10* HEMEROCALLIS

Tribe VII DRACÆNEÆ *Leaves* radical or on an erect woody caudex *Perianth* cylindric funnel shaped or campanulate *Anthers* basifixed or dorsifixed, filaments not inserted in a pit *Fruit* a berry

Ovary with the cells 1-ovuled	11 DRACÆNA
Ovary with the cells many-ovuled	12 CORDYLINE

Tribe VIII ASPHODELEÆ *Rootstock* short, or a bulb *Flowers* racemed or panicled *Perianth* segments distinct *Capsule* loculicidal (berried in *Dianella*)

13 ASPHODELUS
14 EREMURUS
15 CHLOROPHYTUM
16 DIANELLA

Tribe IX. ALLIEÆ *Rootstock* in the Indian genus a bulb *Scape* simple, flowers umbellate or capitate, at first enclosed in a spathaceous involucre *Capsule* loculicidal

Strong scented herbs Perianth rotate 17 ALLIUM

Tribe X SCILLEÆ *Rootstock* a bulb *Scape* simple, naked, flowers racemose not involucrate, bracts at the base of the pedicels small

Perianth 6 lobed tubes cylindric, outer lobes spreading, inner erect 18 DIPCADI
Perianth campanulate 6 partite ovules many seeds flattened 19 URGINEA
Perianth 6 partite Seeds subglobose 20 SCILLA

Tribe XI TULIPEÆ *Rootstock* a bulb *Stem* erect with one or more leaves *Flowers* few large solitary or racemed *Perianth* segments distinct *Capsule* loculicidal (in the Indian species)

21 LILIUM
22 FRITILLARIA
23 LLOYDIA
24 TULIPA
25 GAGEA

Series C *Rootstock* a corm or bulb, or short *Leaves* radical or radical and cauline *Anthers* dehiscing extrorsely or introrsely *Ovules* anatropous *Capsule* usually septicidal

Tribe XII COLCHICEÆ *Rootstock* a tunicate corm *Leaves* all radical *Scape* very short hypogeous, flowers 1–3 *Perianth* tube very long *Anthers* dorsifixed narrow dehiscence introrse

Perianth tube entire styles 3 26 COLCHICUM
Perianth tube of the twining claws of the segments, styles 3 27 MERENDERA

Tribe XIII ANGUILLARIEÆ *Rootstock* a tunicate corm *Stem* 1 or more leaved *Anthers* dehiscing extrorsely *Styles* 3 28 IPHIGENIA

Tribe XIV NARTHECIEÆ *Rootstock* short creeping *Stem* usually leafy *Leaves* often distichous *Perianth* persistent *Anthers* subbasifixed, dehiscence sublateral 29 TOFIELDIA

Tribe XV UVULARIEÆ *Rootstock* tuberous or creeping *Stem* leafy *Leaves* not sheathing *Flowers* axillary *Anthers* dehiscing extrorsely

Stem twining Leaves cirrhose Capsule loculicidal 30 GLORIOSA
Stem erect Capsule septicidal 31 TRICYRTIS
Stem erect Fruit a berry 32 DISPORUM

Tribe XVI MEDEOLEÆ *Rootstock* short or creeping *Stem* simple

† *Branches and branchlets acutely angled*

5 **S. rigida,** *Wall Cat* 5120, leaves ½-1¼ by ⅓-¾ in. subsessile orbicular ovate or ovate-cordate faintly 3 costate, umbels 1-4 fld, sepals elliptic oblong, petals rather narrower 4-5 times longer than the stamens *Kunth Enum* v 164, *A DC Monogr Smilax*, 105 S Wallichii, *Steud Nomencl* (*not of Kunth*)

EASTERN HIMALAYA, Nepal *Wallich*, Sikkim, alt 7-10 000 ft, Bhotan, *Griffith*

A small erect much branched shrub with small coriaceous leaves, dwarf and densely leafy at high elevations, branches acutely angled prickles few small, branchlets slender, distichous. *Leaves* obtuse acute or apiculate base, rounded or cordate, rarely acute, petiole decurrent on the branchlets, with 2 minute deciduous setæ (cirrhi ?), jointed at the top *Peduncle* short, ⅛-⅓ in, bracts lanceolate pedicels unequal; perianth cupular, mbranous anthers minute didymous, subglobose stigmas sessile *Berries* nyrtillus, and next to which A DC places it though regarding it as most nearly allied to *S ferox*

[illegible]

7000 ft, *Clarke*

Closely allied to *S rigida* which it represents in the Khasia, but a more slender plant with larger more ovate acuminate leaves more slender short or long peduncled pedicels and longer but still very short petioles that have a [illegible]

†† *Branches and branchlets terete or nearly so*

7 **S. parvifolia,** *Wall Cat* 5118, leaves 1-3 in ovate or ovate cordate or lanceolate acute or acuminate 3-5 costate often glaucous beneath, base [illegible] very slender sheathing half way up [illegible] ncles and pedicels very slender, bracts [illegible] petals much narrower, filaments very [illegible] legans, *A DC Monogr Smilax* 107 [illegible] *Klotzsch in Reise Pr Wald Bot* 45, t 91

TEMPERATE HIMALAYA, alt 5-8000 ft, from Kashmir eastwards The KHASIA HILLS, alt 6000 ft

Branches very slender stiff terete, smooth, unarmed, branchlets sometimes

8. **S. vaginata,** *Decne in Jaquem Voy Bot* 169, t 169, leaves $\frac{2}{3}$–$1\frac{1}{4}$ in elliptic ovate or cordate obtuse acute or mucronate 5–7-nerved, petiole $\frac{1}{3}$–$\frac{2}{3}$ in very slender narrowly sheathing for $\frac{1}{4}$ to $\frac{1}{2}$ its length, sepals and petals subsimilar oblong much longer than the stamens *A DC Monogr. Smilax*, 109

WESTERN HIMALAYAS, from Kashmir to Kumaon, alt 6 9000 ft, *Falconer, Jacquemont, Thomson* UPPER ASSAM, Naga hills, alt 9000 ft, *Clarke*

A slender diffuse unarmed shrub, branches white, smooth, terete *Leaves* membranous, cuneate or subcordate at the base, petiole jointed below the top *Peduncles* and *pedicels* very slender, male umbel many fld, fem 1-fld, flowers purplish, bracteoles 0 —De Candolle says of this manifestly allied to *S parvifolia* (his *S elegans*), differing in the petiole articulate below the limb without cirrhi, and staminodes 6 The h ibitats he gives of Hyderabad, alt 4000 to 6500 ft, cannot apply to the city of that name in the Deccan

9 **S. longobracteolata,** *Hook f*, stems slender, branches terete, [illegible] arrowly [illegible] uncled, [illegible] rather [illegible] legans, [illegible] major, *A DC Monogr Smilax*, 10[illegible]

KHASIA HILLS, at Myrung, alt 5 6000 ft, *J D H & T T*

Branches terete, quite smooth rather slender *Leaves* thin, finely reticulated, petiole articulate at the top? sheathing portion coriaceous, margins recurved, tips cuspidate, recurved, cirrhi inserted above the cusps *Male umbels* small, few-fld, shortly peduncled pedicels $\frac{1}{6}$ in, bracteoles shorter than in the fem, subulate, sepals $\frac{1}{10}$ in, fem peduncles naked at the base, inserted a little above the axil of the leaf, pedicels $\frac{1}{4}$–$\frac{1}{3}$ in, sepals lanceolate, acuminate, petals narrower, stigmas very short —The larger leaves and long rigid bracteoles of the fem umbels distinguish this from *S parvifolia* and *minutiflora*

10 **S. minutiflora,** *A DC Monogr Smilax*, 100 [illegible]

[illegible] stamens, fem umbels very few-fld, peduncle very long slender

SIKKIM HIMALAYA, alt 6–9000 ft, *J D H* KHASIA HILLS, *Griffith*

Branches strict, woody, unarmed, smooth, scales at the base of the flowering branches $\frac{1}{4}$–$\frac{1}{2}$ in long *Leaves* pale beneath, nervules laxly reticulate, petiole articulate below the limb, cirrhi 0 *Peduncle* of male umbel slender, pedicels $\frac{1}{4}$ $\frac{1}{2}$ in; buds globose *Berries* $\frac{1}{4}$ in diam black — Differs from *S vaginata* in the more acute or acuminate leaves, and shorter petiole, from *S parvifolia* in the nerves of the leaf descending into the petiole before reaching the joint," *A DC*, I doubt its being anything but *parvifolia*

11 **S. elegans,** *Wall Cat* 5117 A, branches slender tctcte, leaves 2–3 in ovate or ovate cordate acute or acuminate thin 5 costate petiole $\frac{1}{3}$–$\frac{1}{2}$ in sheathing half way up or more, male and fem peduncles and pedicels capillary, umbels few fld, sepals ovate-oblong, petals obovate, anthers subsessile, ovary globose *S menispermoidea*, *A DC Monogr. Smilax*, 105

TEMPERATE HIMALAYA, Kumaon and Nepal, *Wallich*, Sikkim alt 7–11,000 ft, *J. D H*, *Clarke*

A small shrub, branches and branchlets quite smooth, unarmed *Leaves* variable

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eceptacle
he base
oad thin

** Flowers large or small, sepals rarely less than $\frac{1}{6}$ in long Stamens equalling or longer than the sepals, rarely $\frac{1}{3}$ shorter

† Umbels many spicate on an axillary peduncle

12 **S. aspera,** *Linn Sp Pl* 1028, leaves $1\frac{1}{2}$–6 in ovate deltoid or lanceolate base hastate or cordate, sepals linear-oblong, petals rather narrower, anthers linear shorter than the filaments *Reichb Ic Fl Germ* x t 428, *A DC Monogr Smilax* 163 (*vars* genuina Perrottetiana and maculata) S maculata, *Roxb Fl Ind* iii. 796 *Wall Cat* 5113, *Ro le Ill* 381, *Kunth Enum* v 218 *Wight Ic* t 2059, *Thwaites Enum* 338 (*excl syn Villandia*) *Boiss Fl Orient* v 343 S fulgens, *Wall Cat* 5122 S nilagarensis *Steud Pl Exsicc Hohen n* 952

Throughout India, from KASHMIR alt 4–7000 ft to the KHASIA HILLS and southward to TRAVANCORE alt 4–7000 ft, and CEYLON ascending to 5000 ft — DISTRIB Syria, S Europe N Africa

Leaves usually blotched with white, 5–9 rounded or oblong petiole $\frac{1}{2}$–$\frac{3}{4}$ in and ...lly long *Spikes* 2–6 in, rich s slender ...nate, flowers white sweet scented, buds longer than the pedcels, male sepals $\frac{1}{6}$ in long, fem rather smaller staminodes 6, stigmas oblong recurved *Berries* $\frac{1}{4}$–$\frac{1}{3}$ in, blueish, usually 3 seeded

†† Umbels solitary binate or panicled on a common peduncle

§ Branches rough hispid or granulate

13 **S. aspericaulis,** *Wall Cat* 5129, branches terete scabrid leaves 2–8 by 2–3 in oblong or linear oblong thin 3 costate from above the base ... narrowly sheathing below the middle, ... narrow, stamens as long as the ... Roxburghiana, *Wall Cat* 5115,

SIKKIM HIMALAYA alt 1–3000 ft, *J D H* (6000 ft *King*) The KHASIA HILLS and BURMA *Wallich* &c ANDAMAN ISLANDS, *Kurz* PERAK, *King s Collector*

Branches unarmed or aculeate, sometimes closely *Leaves* rounded or cuneate at the base *Umbels* many fld, solitary or 2 3 on a common peduncle $\frac{1}{2}$ in long partial peduncle as long, buds clavate $\frac{1}{4}$ in long, bracteoles obsolete, fem recept globose, pedicels $\frac{1}{4}$ in, fem fl not seen *Berries* nearly $\frac{1}{4}$ in diam — If this is Blume's *S odoratissima* that is the earliest name

14 **S. barbata,** *Wall Cat* 5125, branches very stout terete densely bristly, leaves 6–10 in long and broad elliptic or orbicular cordate coriaceous cusp date 7 costate from above the base, petiole very stout base sheathing and bristly, umbels very long peduncled *A DC Monogr Smilax*, 196 S setosa, *Miq Fl Ind Bat Suppl* 610

SINGAPORE, *Wallich, Hullett* — DISTRIB Banca

Leaves coarsely reticulate, white beneath; petiole 1–$1\frac{1}{2}$ in, male umbels very

sepals ⅓ in long

MALAYAN PENINSULA Perak K ngs Collector

Stem 40 ft branches angular lower as th ck as the l ttle finger w th many con c l sp nes ½ in long *Lea es* very smooth on both su faces nerves obscure mmersed
so et es l
obtuse pe
st g na muc

16 **S. pallescens,** *A DC Monogr Smilax* 198 branches terete granulate leaves 5 10 by 2 3½ in narrowly oblong tip r unded and broadly caudate thin pale 5 costate from the rounded or subacute base petiole ⅔ in obscur ly sheathing articulate at the middle

UPPER ASSAM in the Mishmi H ll Griffith

The sol t ry spec n en of th s fine spec es cons ts of a branch th leaves and male racemes w th a so tary flo er The branch s un rmed ot scabr d l ke *asper caulis* and hardly warted as descrıb d by De Candolle but granulate the racemes are very slender 2 5 in long wh te the umb ls 1–3 nate pe l ncles ½ ⅔ i l var cate the bracts are all go e —I have seen no flo ers Gr ff th descr b s th m as green sh bro n spotted th red and th l te anthers

§ Branches smooth usually aculeate

a Umbels solitary rarely 2 nate peduncle bracteate or not below the middle

17 **S ferox,** *Wall Cat* oll bra ches stout acul at leaves ly l 2 in ell ptic or o at or ob v t lo cute or mucronat r il 3 costate base cuneate or rounded petiole ½ in broad r a ous sh athing tum dly for half its len th sepals in l t l oblong s b equal stamens 6 more third shorter than th sepals *A DC M nogr Smilax* 103 S China *Maxim Dec* v 17 (th *I l an pl* S Thomsoni na *A DC l c* 104

EASTERN HIMALAYA N pal *Wall* K kk alt 6 8000 ft *J D H* BENGAL *Griffith* (*Kew Distrib* 5410) MUNNIPORE Watt —D TRIB China k a

A st ut shrub b a ch s str ngly pr ckly terete br ll ts uar d a led *Lea es* coriaceous and ... fr m the so ... the l a es are ... 2 ... rare ... obl ... p tals s mil r sta ... s 3 ... ary ... *Berr* s ... in d a ... l ... seed ... —The st s are cert l ... spec ... D Candol re arks on th close aff t of th s w th the ... which refers to sect ... ar ... g ...ruled ... f t e ovary l fu th r l st nguishes *S ferox* by the leaves not cun ate at th base wh h, however they so ne mes are I find no charac ers whereby to d ... Th m son ana as a varie y

. recurved
a diam ,
eceptacle
he base
oad thin

** Flowers large or small, sepals rarely less than ⅛ in. long Stamens equalling or longer than the sepals, rarely ⅓ shorter

† Umbels many spicate on an axillary peduncle

12 **S. aspera,** *Linn Sp Pl* 1028, leaves 1½–6 in ovate deltoid or lanceolate base hastate or cordate, sepals linear-oblong, petals rather narrower, anthers linear shorter than the filaments *Reichb Ic Fl Germ* x t 428, *A DC Monogr Smilax*, 163 (*vars* genuina Perrottetiana and maculata) S maculata, *Roxb Fl Ind* iii 796 *Wall Cat* 5113, *Royle Ill* 384, *Kunth Enum* v 218, *Wight Ic* t 2059, *Thwaites Enum* 338 (*excl syn Villandia*) *Boiss Fl Orient* v 343 S fulgens, *Wall Cat* 5122 S nilagarensis, *Steud Pl Exsicc Hohen n* 952

Throughout India, from KASHMIR alt 4–7000 ft, to the KHASIA HILLS and southward to TRAVANCORE, alt 4–7000 ft, and CEYLON, ascending to 5000 ft — DISTRIB Syria, S Europe, N Africa

A large shrub, branches armed or not *Leaves* usually blotched with white, 5–9 nerved, acute or acuminate, basal lobes rounded or oblong, petiole ⅓–⅔ in and nerves beneath often prickly, cirrhi usually long *Spikes* 2–6 in, rachis slender smooth, umbels many fld, bracteoles minute, flowers white sweet scented, buds longer than the pedicels, male sepals ⅙ in long, fem rather smaller, staminodes 6, stigmas oblong recurved *Berries* ¼–⅓ in, blueish, usually 3 seeded

†† Umbels solitary binate or panicled on a common peduncle

§ Branches rough hispid or granulate

s terete scabrid leaves
from above the base
hing below the middle.
tamens as long as the
iana, *Wall Cat* 5115,
in part ? S odoratissima, *Blume*

SIKKIM HIMALAYA, alt 1 3000 ft, *J D H* (6000 ft *King*) The KHASIA HILLS and BURMA, *Wallich*, &c ANDAMAN ISLANDS, *Kurz* PERAK, *King's Collector*

Branches unarmed or aculeate, sometimes closely *Leaves* rounded or cuneate at the bases *Umbels* many-fld, solitary or 2–3 on a common peduncle ½ in long, partial peduncle as long, buds clavate ⅛ in long, bracteoles obsolete, fem recept globose; pedicels ⅓ in, fem fl not seen *Berries* nearly ½ in diam — If this is Blume's *S odoratissima* that is the earliest name

stout terete densely
cular-cordate coria
ole very stout base
A DC. Monogr

SINGAPORE, *Wallich*, *Hullett* — DISTRIB Banca

Leaves coarsely reticulate, white beneath, petiole 1–1½ in, male umbels very

10 in
eaths
3 on
9 in

sepals 3 in long

MALAYAN PENINSULA Perak *K ngs Collecto*
Stem 40 ft branches angular lower as th ck as the l ttle finger th many conical sp nes ¼ n long *Lea es* very smooth on both surfaces ner es ob c re immersed pet ole as th ck as a goo eq ll sh ath cy nb for n of lo r le es w th so et n es la ge sp nes c rch very sto t *Fem fl* sepal broadly oblong l ceol te obtuse petals very narrow stam nod s 3 o ary ob o g st le o e th rd as long st g na much longer th an the style *Berry* 1 n d Male fl not seen

16 **S pallescens,** *A DC Monogr S lax* 198 bra ches terete granulate leaves 10 by 9 3 in narrowly oblong t p roun led and broadly ca date th n pale 5 costate from the rounde l or subacute base pet ole 3 in obscu ly sh eathing artic ulate at the middle

UPPER ASSAM the M t n t ll *Griffith*
The sol t ry spec m en of th s fine spec es cons sts of a b anch w t leaves and male race es w th a sol t y flo er The branch s un r ed not so br ll lke *a per aul s* and l ar lly arte l as lese b l b De Cand lle but gr nulate the r ce nes are very sle der 9 o lo g wh ite the umbels 1-3 nate pe lun les ¼ ¾ l l var eate th br cts are all gone —I ha e seen no flo ers Gr ff th descr bes th e n as gree sh bro vn spott l th r d and th h te anthers

§ Branches smooth usually aculeate

a Umb ls solitary rar ly 9 nate ped uncle bracteate or not below the middle

17 **S ferox,** *W ll C t* 5119 bran hes stout a leate leaves l y l 9 1 ell pti r o t or ol v te llo c te or n r at r l 3-5 costate ba e cu eate or round d p ole 1 in bro d orn a ous sh eathing tun dly for half its l n th p als and p t l l long s b equal sta ens 6 9 or e third shorter than th sep als *A DC M or Smil x* 1C 3 S Chi na *W ta n Dec v* 1 (*H I l an y l t* Thom om na *A DC l c* 104

EASTERN HIMALAYA N pal *Wall* k S kk n sh o 8000 ft *J D H* BENGAL *Griffith* (*K w l st b* 5440) M SS ? RE W at —D a a T uk n
A st ut sh b b a c es stra ly ly terete b s ts unar ed an led *Lea e* ep uncta ant l n l r s l n l fa l le p tel at the sh a l *l* s from the s oo s nly f a b l v s ar br us sut ls ou b n a l ped l ra r rand 9 te ¼ ¾ n lo g o s r t ta ted o ate a m a s p l l o at oblo tal s m l r ta n l s 3 o ary obl s r st les *F r s l n l s* l 9 s eded —The st n ns a ce ta n s n mes 9 n S kk m s ec ns D Candol re s ks on th clos af y of th s w h the Ch na *S n Ch na* wh ch he ref rs to sect Ne r a s g 9 celled cel s of the ovary le fu ther d ngu l es *S f rox* by th e l a es n t con ate at the ba e wh ch however th e e net mes are I find no characters whereby to d s ngu sh & *Ti m* s n ona as a variety

** Flowers large or small; sepals rarely less than 1/6 in. long Stamens equalling or longer than the sepals; rarely 1/3 shorter

† Umbels many spicate on an axillary peduncle

12 **S. aspera,** *Linn Sp Pl* 1028; leaves 1½–6 in ovate deltoid or ... etals rather nar- ... *Ic Fl Germ* ... Perrottetiana and ... *Cat* 5113, *Royle* ... *aites Enum* 338 (*excl syn Villandia*). *Boiss Fl Orient* v 343 S fulgens, *Wall Cat* 5122 S nilagarensis, *Steud Pl Exsicc Hohen* n 952

Throughout India, from KASHMIR, alt 4–7000 ft, to the KHASIA HILLS, and southward to TRAVANCORE, alt 4–7000 ft, and CEYLON, ascending to 5000 ft — DISTRIB Syria, S Europe, N Africa

... blotched with white, 5–9 ... petiole ½–⅔ in and ... 6 in, rachis slender ... sweet scented, buds ... smaller, stem nodes ... 3 seeded

†† Umbels solitary binate or panicled on a common peduncle

§ Branches rough hispid or granulate

13 **S. aspericaulis,** *Wall Cat* 5129, branches terete scabrid, leaves 2–8 by 2–3 in oblong or linear oblong thin 3-costate from above the base ... petiole 1–1 in narrowly sheathing below the middle, ... narrow, stamens as long as the ... Roxburghiana, *Wall Cat* 5115,

SIKKIM HIMALAYA, alt 1 3000 ft, *J D H* (6000 ft, *King*) The KHASIA HILLS and BURMA, *Wallich*, &c ANDAMAN ISLANDS, *Kurz* PERAK, *King's Collector*

Branches unarmed or aculeate, sometimes closely *Leaves* rounded or cuneate at the bases *Umbels* many-fld, solitary or 2–3 on a common peduncle ½ in long, partial peduncle as long, buds clavate ¼ in. long, bracteoles obsolete, fem recept globose; pedicels ⅓ in, fem fl not seen *Berries* nearly ½ in diam — If this is Blume's *S odoratissima* that is the earliest name

14 **S. barbata,** *Wall Cat* 5125, branches very stout terete densely bristly, leaves 6–10 in long and broad elliptic or orbicular-cordate coriaceous cuspidate 7 costate from above the base, petiole very stout, base sheathing and bristly, umbels very long-peduncled *A DC. Monogr Smilax*, 196. S setosa, *Miq Fl Ind Bat Suppl* 610

SINGAPORE, *Wallich*, *Hullett* — DISTRIB. Banca

Leaves coarsely reticulate, white beneath, petiole 1–1½ in; male umbels very

15 **S. Kingii,** *Hook f*, branches very stout granulate, leaves 5–10 in. orbicular ovate or elliptic and very large cymbiform petiolar sheaths thickly coriaceous 5–7-costate from the base, petiole 2–3 in, umbels 1–3 on a very short common peduncle, partial peduncles 1–3 in, pedicels 1½–2 in, sepals ⅓ in long

MALAYAN PENINSULA, Perak, *King's Collector*

Stem 40 ft; branches angular, lower as thick as the little finger with many conical spines ¼ in long *Leaves* very smooth on both surfaces, nerves obscure, immersed; petiole as thick as a goosequill, sheath cymbiform of lower leaves with sometimes large spines, cirrhi very stout *Fem fl* sepals broadly oblong lanceolate, obtuse, petals very narrow, staminodes 3, ovary oblong, style one-third as long, stigma much longer than the style *Berry* 1 in diam Male fl not seen

16 **S. pallescens,** *A DC Monogr Smilax*, 198, branches terete granulate, leaves 5–10 by 2–3½ in narrowly oblong tip rounded and broadly caudate thin pale 5 costate from the rounded or subacute base, petiole ⅝ in obscurely sheathing articulate at the middle

UPPER ASSAM, in the Mishmi hills, *Griffith*

The solitary specimen of this fine species consists of a branch with leaves and male racemes with a solitary flower The branch is unarmed not scabrid like *aspericaulis*, and hardly warted as described by De Candolle, but granulate, the racemes are very slender, 2–5 in long, white, the umbels 1–3 nate, peduncles ¼–⅓ in divaricate, the bracts are all gone —I have seen no flowers Griffith describes them as greenish-brown spotted with red, and with white anthers

§ Branches smooth, usually aculeate

α Umbels solitary rarely 2-nate, peduncle bracteate or not below the middle

17 **S. ferox,** *Wall Cat* 5119 branches stout aculeate leaves 2½–3½ by 1–2 in elliptic or ovate or obovate oblong acute or mucronate rigid 3–5-costate base cuneate or rounded, petiole ¼ in broad coriaceous sheathing tumidly for half its length, sepals and petals oblong subequal, stamens 6–9 one third shorter than the sepals *A DC Monogr Smilax*, 103 S China, *Maxim Dec* v 172 (*the Indian plant*) S Thomsoniana, *A DC l c* 104

EASTERN HIMALAYA, Nepal *Wallich*, Sikkim alt 3 8000 ft *J D H* BENGAL, [illegible] Watt —DISTRIB Tonkin

[illegible] terete, branchlets unarmed angled [illegible] nerves very slender, nervules faint, [illegible] n the young shoots only, of which the leaves are membranous subglaucous beneath, peduncles rather stout solitary, rarely 2 nate, ¼ ⅜ [illegible] ¼ in long ovate oblong, pe[illegible] es, stout *Berries* ⅓ in diam [illegible] in Sikkim specimens De C[illegible] 'China," *Sm China*, which *he refers* to sect *Nemexia* having 2-ovuled cells of the ovary; he further distinguishes *S ferox* by the leaves not cuneate at the base, which, however, they sometimes are I find no characters whereby to distinguish *S Thomsoniana* as a variety.

A lofty climber, branches terete, sparsely prickly *Leaves* shining, acute or

asia hills, Kurz, as a habitat, but I have seen no specimens and suspect some or

27 **S. polyacantha,** *Wall Cat* 5127, branches slender closely ...lly, leaves 4–6 by 1½–2 in coriaceous elliptic lanceolate acuminate at ...ends 3–5 c state from above the base, petiole stout narrowly sheath below the middle, umbels solitary or 2 on a very short common ...ncle many fld fem sepals ⅒ in long *Kunth Enum* v 239, *A DC* ...ogr *Smilax*, 176

PENANG, *Porter*

Branches terete, as thick as a crow quill prickles short, straight *Leaves* ...owel into the petiole, which is ¼ 1 in, strongly 3 costate with slender sub ...nal nerves, cirrhi slender *Common peduncle* very stout, partial (fruiting) ...out, receptacle ovoid, bracteoles minute, ovate, fem fl very small ...recurved styles

...hiana, *Wall Cat* 5115, branches terete branch ...8 in polymorphous oblong ovate or ovate ... cordate or cuneate 3–5 costate from above the ... petiole with very large broad 2 auricled sheaths below the middle, ...ls solitary or 2–3 on a common peduncle many-fl, sepals ¼ in long, ...oblong, stamens as long as the sepals S ocreata and orthoptera, ...*Monogr Smilax*, 193, S macrophylla, *var* cacharensis, *A DC l c* ... prolifera, *Wall Cat* 5124 B, D, *in part* S laurifolia, *Roxb in*

HIMALAYA from Garwhal Eastwards, SILHET, CACHAR, the KHASIA ...IAR (on Parus-nath)

... or less prickly, branches smooth *Leaves* on young shoots 6 by ... lanceolate base acute, petiole ½–1 in, in older 8 by 3½ in ovate or ..., obtusely acuminate, on still older 5-7 by 2½–4 in oblong or broadly ... 5-costate, base rounded cordate or truncate costæ in all united ..., auricles in old leaves 1–1½ in produced behind into rounded lobes ... branch *Umbels* 1–3, peduncles very variable in length and position ... peduncle 1–3 in, bracteate at the base receptacle globose fem ... fl, pedicels ¼ in slender, staminodes 3, stigmas long recurved ... am, pedicels as long or longer *Seeds* 2 hemispheric or solitary and ...ose, l... han ¼ in diam

29 **S. megacarpa,** *A DC Monogr Smilax* 166, branches terete ...ooth unarmed, leaves 3–7 in elliptic ovate or oblong 3 costate from ...ove the base, petiole ¾–1½ in, sheath short narrow, umbels many fld ...licels ¼ in slender, sepals ⅙ in long ligulate, petals very narrow ...ments very long slender, berry the size of a cherry 3 celled, seeds ...ticular

... KHASIA HILLS, ... MALACCA, ... PERAK ... ... DISTRICT Tonkin

There are two forms (or species) included here, differing greatly in foliage, Khasian and Malayan, but agreeing in their remarkable fruit and seeds Both ...e fruiting branches rather thicker than a crow-quill very rigid unarmed. In ... Khasian the leaves are elliptic or ovate 3–4 by 1 nearly 2 in ...usually acuminate

margined, contracted at the base near to which the slender costæ unite, they are thin shining with finely reticulate nervules, the petiole is $\frac{3}{4}$ in long, sheathing about $\frac{1}{3}$ way up and articulate at the tip In the Maingay specimen the leaves are detached, 6 by 3 in, broadly oblong rounded at the tip, very coriaceous, the costæ are much stouter, they match well the older leaves of Griffith's specimen In both the umbels are numerous along the rigid branches *Umbels* 1–3 on a stout

γ Umbels more than three alternate or whorled over the rachis of a common peduncle

30 **S prolifera,** *Roxb Fl Ind* iii 795, branches stout terete prickly, leaves 4–8 by $1\frac{1}{2}$–6 in from ovate acuminate to orbicular ovate or oblong cuspidate 3–7 costate from above the rounded or subcordate base, petiole 1–2 in sheathing portion usually forming two large basal amplexicaul erect or reflexed auricles, racemes elongate, umbels 10–20 3 nate or whorled many fld *Wall Cat* 5121, A, B, D (in part) E, G, H, *Kunth Enum* v 247 (*excl syn* ovalifolia) S laurifolia, *Roxb l c* 793 S laurina *Kunth l c* 248 S ovalifolia, *A DC Monogr Smilax*, 199 (*not of Roxb*) ? S macrophylla, *Dalz & Gibs Bomb Fl* 246 S. macrophylla, var polycephala, *A DC l c* 194 S umbellata, *Herb. Heyne.*

TROPICAL WESTERN HIMALAYA, Kumaon, *Strachey & Winterbottom* (*Smilax* Nos 6 7) NEPAL, *Wallich* SILHET, BENGAL, BEHAR, BURMA, the DECCAN PENINSULA and CEYLON

Stem stout, more or less strongly armed, climbing *Leaves* extremely variable in form and size, costæ 3–7, the three inner united above the base,

filaments slender, staminodes of fem fl 3, ovary oblong, stigmas large, long, erect, very deciduous *Berries* red, the size of a pea *Seeds* small, biconvex —De Candolle [illegible] *ovalifolia* Roxburgh's drawings and [illegible] *nervulosa*, A DC l c 200 from [illegible] possibly a different species; the [illegible] ulate, with 3 costæ meeting at the [illegible] nearly $\frac{1}{2}$ in long and at basal the racemes are shorter, the flowers rather larger, and pedicels shorter than in true *prolifera* Var *rariglobo*, A.DC l c 200 (a solitary male specimen) resembles *nervulosa* in foliage, but has smaller petiolar sheaths, small panicles of minute flowers with sepals and narrow petals $\frac{1}{10}$ in long, it is, I think a very different species, its habitat is doubtful, being in a miscellaneous collection of Griffith's, [illegible] *New Distrib*) but b[illegible] also a [illegible] resembles a Calcutta Bot Gard [illegible] *urz* (n 2636) with 8 9 stamens [illegible] nous Indian species that I have examined

large obtuse incurved auricles male umbels very many fld ped cels hardly longer than the sepals *A DC Mo ogr S ilax* 00

PENANG *Griffith Curtis* PERAK *King s Collector* —DISTRIB Malaya Coel n ch na

Branches stout qu te s nooth more or less pr ckly *L aves* retu e acute or acu te nervules obsc re *Inf re cence* rreg l ly br l l d ncles of t n l ½ 3 bracteo es ob cur b ds ½ n lo g l te l els sle der abo t as lo g e l ls l n ar fil e ts slend r antl s l ne r

32 **S Blumei,** *A DC Mo ogr S ilax* 202 branches stout terete leaves 8 4 in orbicular ovate acute or obtuse tomentose beneath sto itly co tate from above the ba e petiole in very sto t sheathing l ise 1 in with inflexed sides and acute t ps fr ting umbels on a sl ort sto it com non peduncle receptacle large globos deeply p tted pedicels 1 1¼ b perfol ata *Blume L* 18 (*t f lo*)

MALACCA *Ma ngay* at Ulu Bubo g *I g Collec or* —D STRIB Ja a

Br nches p kly *I a* co ceou co t e n l tr s r r ules leeply s k abo l g tly r e l e tl *I bel* o n on on ped ncle 1 3 n les lo g a l s tl ck s n cro qu ll O l s ol tar b r es tr g no s at the apex (*Ma ngay* s) —l esembles *S le cophylla* but tl le v s r to o a l ot glau s b tl

33 **S Griffithii,** *A DC Mo og S l x* 108 l ancl es obt sely angled smooth lea es 1 by 3½-4½ n ovat acum nate ostate from tl e c reate ba e co acco s l tole 1 in art c lat tl e m ddle l a e sl eatl ng with two ro ded aur l s n al panicles unl elled buds cl vate

UPPER ASSAM or UPPER BURMA *Griffith*

I an (yo g) f kles *Lea e* rel l ro n l en lry *Pa* c e t l lo g *l b* 4 te pedu l s ½ pe l s ¼ s p ls

or 2 nate very short, perianth segments reflexed *Baker in Journ Linn Soc* xiv 614 A asiaticus, *Wight, Ic* t 2053 (*not of Linn*) A Cu... *Wall Cat* 5155, B

NILGHIRI HILLS, *Wight, Schmidt*

A small erect or tall and variable bush, densely branched, branches flexuous, upper internodes very short *Spines* ⅛–¼ in *Cladodes* ascending, spreading and curved, rather stout, variable in breadth *Pedicels* jointed above the middle *Perianth* segments oblong lanceolate, anthers oblong *Berries* ¼ in diam

7 **A. Jacquemontii,** *Baker in Journ Linn Soc* xiv 615, stem terete smooth, branches angled ribbed and grooved, leaves spinescent, cladodes 2 5 nate ½ in slender 3 goneus curved acuminate, flowers solitary or in axillary pairs on a short peduncle, pedicels very short jointed under the minute perianth

The CONCAN, between Poona and Carli, *Jacquemont*

Tall, much branched, branches spreading and decurved spines ¾–1¼ in conical *Cladodes* much longer than the internodes *Flowers* ⅛ in diam, pedicels many times shorter than the cladodes

8 **A. asiaticus,** *Linn Sp Pl* 409, stem scandent terete smooth, branches grooved, cladodes 6–∞ nate ⅙–¼ in very slender acicular terete acuminate, flowers axillary solitary or umbelled pedicels almost equalling the cladodes jointed in the middle

DECCAN PENINSULA *Herb Rottler*, Bellary *Beddome* —DISTRIB Afr trop

Stem slender, branches deflexed *Flowers* $\frac{1}{10}$ in diam

** *Flowers racemed*

† *Cladodes subulate terete or triquetrous, somewhat flattened in A* Curillus

9 **A. nepalensis,** *Baker in Journ Linn Soc* xiv 622, subscandent, stem robust smooth branches angled not grooved, spines stout recurved, cladodes 3–6 nate ⅛ in acicular spreading or ascending triquetrous acute, racemes short 1–3 nate sometimes branched below perianth campanulate A Curillus, *Wall Cat* 5155, C

NEPAL, *Wallich*

An excessively branched undershrub *Spines* ¼–½ in conical *Cladodes* nearly straight *Racemes* ½ in, bracts minute, lanceolate, pedicels jointed above the middle *Perianth* ⅛ in diam, anthers very minute oblong, purple *Fruit* ¼ in diam

10 **A. racemosus,** *Willd Sp Pl* ii 152, stem scandent woody terete, branches triquetrous striate, lower spines long, cladodes 2–6 nate ⅔–1 in slender finely acuminate falcate divaricate, racemes solitary or fascicled simp[illegible]
segments spre[illegible]
ii 151, *Wall*[illegible]
volubilis, *Ha*[illegible]
5152 A, B, F[illegible]
(*not of Linn*)
Nor Ann[illegible]
Brownei (in *p*[illegible]
Kunth l c [illegible]

Throughout TROPICAL and SUBTROPICAL INDIA and CEYLON ascending the

large ol-fa to 4000 ft from Kashmir eastwards —DISTRIB Tropical Africa, Java and [illegible] alia

varieties —

Var *javanica*, Baker l c 624 cladodes ½–1 in very slender erect flexuous, racemes narrow with terminal tufts of cladodes, perianth segments narrower Asparagopsis javanica, *Miquel Fl Ind Bat* iii 562 A sarmentosa, *Dalz & Gibs Bomb Fl* 246 (*not of Kunth*) —Deccan Peninsula, Java

Var *subacerosa*, Baker l c, cladodes strict ⅓–¾ in stout racemes small few fld, rachis and pedicels capillary —Sikkim, alt 1–4000 ft, *J D H* —A form approaching *A acerosus*

11 **A. zeylanicus**, *Hook f*, stem stout smooth obscurely angled, branches acutely angled cladodes 3–5 nate ½ in stout falcate triquetrous narrowed to both ends tips subspinescent racemes 3–5 in very stout, bracts lanceolate, flowers large, anthers large A acerosus, *var* zeylanicus, *Baker in Journ Linn Soc* xiv 623

CEYLON, alt 6000 ft, *Walker*, at Newera Ella *Gardner*, *Thwaites* (Cp 2299)

The stout triquetrous cladodes thickened in the middle stout racemes, large flowers ¼ in diam, and large anthers seem to distinguish this from *A racemosus*

12 **A. lævissimus**, *Steud in Hohen Pl exsicc Nilgh* Nos 1304, 1305, stem subscandent terete smooth branches very slender triquetrous, spines short strong cladodes 3–6 nate ¼ in spreading stout triquetrous acuminate, racemes dense fld pedicels very short bracts large cymbiform, perianth segments widely spreading anthers minute *Baker in Journ Linn Soc* xiv 623 A volubilis *Wall Cat* 5154 K

WESTERN GHATS from the Concan southwards

Differs from *A racemosus* of which Baker says it is little more than a variety, chiefly in the longer cladodes, and large bracts, which sometimes exceed the pedicels

13 **A. acerosus**, *Roxb Fl Ind* ii 150, stem tall subscandent smooth, branchlets very slender stiff ascending angled spines short recurved, cladodes 3–6 nate 1–2½ in suberect strict triquetrous acuminate, racemes short solitary or 2 nate, bracts lanceolate concave perianth segments widely spreading *Baker in Journ Linn Soc* xiv 624, *Wall Cat* 5152 C, D, F A fasciculatus, *Br Prodr* 281 (*in part*) Asparagopsis acerosa and Brownei (*in part*), *Kunth Enum* v 102, 103

BENGAL, *Roxburgh*, *Clarke* &c CHITTAGONG (cult), *J D H & T T* PEGU, *McClelland* BURMA *Wallich*, &c —DISTRIB N Australia

An excessively branched under shrub, roots tuberous branchlets grooved. *Spines* ⅛–¼ in slightly curved *Cladodes* shining, persistent *Racemes* 1–1½ in, pedicels ⅛–¼ in jointed in the middle *Flowers* pure white, fragrant, anthers minute, subglobose *Ovules* many in each cell *Berry* ⅛–¼ in diam, 1 seeded.

in *Leaves* 1½–2 in,
1 n as long as the leaves
Per tube —I have seen no
specimen

5 **P. Hookeri,** *Baker in Journ Linn Soc* xiv 558, dwarf, leaves opposite or the lower alternate sessile linear obtuse glaucous beneath, flowers solitary, perianth tube cylindric, stamens inserted about the middle of the corolla

TEMPERATE HIMALAYA, alt 10–12,000 ft, Garwhal, *Duthie*, Sikkim, at Lachen, *J D H*

Stem 1–2 in *Leaves* crowded, ¾ 3½ in, nerves slender *Flowers* suberect, violet, pedicels ⅛–¼ in *Perianth* ½–1 in long, lobes variable in length, much shorter than the tube *Style* short —Probably a state of *P verticillatum*, except from the insertion of the anthers I should be disposed to include it under *P graminifolium*

6 **P. geminiflorum,** *Decne in Jacquem Voy Bot* 170, t 170, stem

WESTERN HIMALAYA, alt 7–11,000 ft, from Kashmir to Kumaon —DISTRIB Affghanistan

Stem 12–18 in flexuous *Leaves* 2–4 in, rarely solitary, acute base cuneate, nerves beneath puberulous *Peduncles* and *pedicels* ¼–½ in, bracteoles minute, caducous *Perianth* ½ in ⅔ in long white, lobes much shorter than the tube, green *Anthers* inserted above the middle of the tube, filaments very short glabrous *Style* as long as the ovary —*Probably a form of P verticillatum*

7 **P. Griffithii,** *Baker in Journ Linn Soc* xiv 558, stem tall glabrous terete, leaves opposite sessile membranous linear lanceolate acute or acuminate 3 nerved, peduncles 2 fld, perianth tube constricted above the ovary

EASTERN HIMALAYA;

Stem 3 ft, slender
Peduncles and *pedicels* ½–
green *Stamens* inserted
anthers minute *Style* filiform, 2 3 times as long as the ovary

8 **P. Cathcartii,** *Baker in Journ Linn Soc* xiv 559, stem tall glabrous terete, leaves all opposite subpetioled ovate oblong or lanceolate acuminate 3–7 nerved peduncle 2–4-fld, perianth short broad slightly contracted in the middle

SIKKIM HIMALAYA, woods at Lachen, alt 8–10,000 ft, *J D H*, *Clarke* NAGA HILLS alt 9000 ft, *Clarke*

Stem 2 3 ft, spotted with purple *Leaves* 2–4 in, spreading, green above, glaucous beneath *Peduncles* 1 3 in *Pedicels* ⅛–1⅛ in *Perianth* ¾ in, green or yellowish, tube constricted in the middle, lobes short, deltoid, green *Anthers* inserted about the middle of the tube *Style* as long as the ovary *Berry* ¼ ½ in diam *Seeds* few or many, globose —I have described the perianth from a drawing in the Cathcart collection

9. **P. oppositifolium,** *Royle Ill.* i 380, stem tall furrowed,

glabrous, leaves opposite or a few ...
oblong acuminate, shining above,
fld, perianth-tube cylindric *Bake*
Enum v 141 Convallaria oppos
380 with a figure, *Cat* 5134, *D*
Hook Exot Fl t 125, *Bot Mag* t 3529

TEMPERATE CENTRAL and WESTERN HIMALAYA, from Nepal eastwards. KHASIA HILLS, alt 4–6000 ft MUNNIPORE, alt 3500 ft *Clarke* Patkoye hills, in UPPER ASSAM, *Griffith*

Stem 2–4 ft, rhizome of green tubers *Leaves* many, spreading, 3–6 in, bright green above, 7–9-nerved, pale beneath with reddish ribs *Peduncle* many-fld and pedicels ½–¾ in *Perianth* ⅓–¾ in, all white, or tube with deltoid lobes greenish *Stamens* inserted above the middle of the tube, filaments papillose, tips of anthers exserted *Style* twice as long as the ovary *Berry* ¼ in diam, broadly ovoid or ellipsoid, scarlet *Seeds* many, globose

Var *decipiens*, Baker l c, leaves shortly petioled lower alternate lanceolate very acuminate 3–4 in broadest above the middle *Wall Cat* 5134 B Sikkim, alt 7–11,000 ft *J D H* Khasia hills, alt 4–5000 ft —Approaches *P. Cathcartii*

10 **P. punctatum,** *Royle Ill* 380, stem angled and grooved glabrous, leaves petioled or subsessile opposite rarely alternate coriaceous oblong lanceolate obtuse or obtusely acuminate, rather shining above 5–7-nerved, peduncles 2 many fld, perianth urceolate mouth contracted *Kunth Enum* v 142, *Baker in Journ Linn Soc.* xiv 559, *Bot Mag* t. 5061 Convallaria punctata *Wall Cat* 5133 Convallaria sp. *Griff Notul* 243, *Ic Pl Asiat* t 274

TEMPERATE HIMALAYA alt 5–8000 ft from Nepal, *Wallich*, to Bhotan, *Griffith*. Munnipore, alt 7000 ft, *Watt*

Stem 1 2 ft *Leaves* many 2–3 in, broadest in the middle, base cuneate, pale ... *Perianth* ⅓–½ in ... inserted above the ... long as the ovary. ... differs in its more

*** *Leaves usually whorled.*

11 **P. verticillatum,** *Allioni Fl Pedem* i 131, stem tall angled and grooved glabrous, leaves 4–6-nately whorled sessile linear or linear-lanceolate acuminate membranous, peduncles 2–3 fld whorled, perianth constricted at the middle *Kunth Enum* v 142, *Baker in Journ Linn Soc* xiv 560, *Desf in Ann Mus* ix 49, *Redoute Lil* t 244, *Maximov Diagn* xi 852 P leptophyllum, *Royle Ill* 380 P Jacquemontianum, *Kunth Enum l c* 143 P roseum *Bot Mag* t 5049 (and Kunth ?) Convallaria verticillata *Linn Sp Pl* 315, *Reichb Ic Fl Germ* t. 966 C leptophylla, *Don Prodr* 47

... –11,000 ft to Sikkim, alt ... achey ... *Winterbottom* —Distr ...

... ies as thick as the ...
Leaves 3–6 by ⅛–1 in., green above, glaucous beneath, often ciliolate ... margins and nerves. *Peduncles* and pedicels ¼–⅓ in *Perianth* very variable ...

⅓–½ in, greenish or lilac, tube slender *Stamens* inserted above the middle of the tube, anthers subsessile *Style* as long as the ovary *Berry* ¼ in diam, 6–10 seeded *Seeds* globose —There is a tendency in the leaves of some specimens to become circinate at the tip, thus passing into the following

12 **P. cirrifolium,** *Royle Ill* 380, stem flexuous often climbing by the tips of th...
whorled sessile n
whorled, perianth
854 P sibiricum
cirrifolia, *Wall*
Prodr 47

TEMPERATE HIMALAYA from Simla eastward to Bhotan, alt 5–11 000 ft MUNNIPORE, alt 4000 ft —DISTRIB Northern Asia

Stem 2–4 ft very weak, flexuous *Leaves* 3–5 in, gradually narrowed into the ... reen or purplish *Style* as long as the number of ... im Baker has included this under *P sibiricum*, probably rightly, but Maximowicz does not

13 **P. Kingianum,** *Collett & Hemsl in Journ Linn Soc* xxviii 1381, t 21, very robust, leaves 5 nately whorled or 2 3 nate sessile coriaceous linear lanceolate with a thick circinate apex, peduncles 1–3-fid, perianth subcylindric

BURMA, in the Shan hills alt 4000 ft, *Collett*

A much stouter plant than *P cirrifolium*, with thick leaves, and flowers three-fourths of an inch long perianth lobes very short, anthers large inserted above the middle of the tube, filaments very short —Only one specimen seen

UNDESCRIBED SPECIES

P INGLESII Royle Ill 380 from Rald ing

5 STREPTOPUS, *Michaux*

Rootstock creeping *Stem* leafy *Leaves* alternate, sessile or amplexicaul *Flowers* axillary *Perianth* campanulate or open, segments deciduous *Stamens* hypogynous or 3 inner adnate to the bases of the segments, filaments broad at the base, tip acute, anthers erect, basifixed between the lobes, connective sometimes produced *Ovary* sessile, style-arms 3 stigmatose within, cells many ovuled *Berry* subglobose *Seeds* many oblong curved striate, testa thin adnate, embryo cylindric — Species 4, N temp regions

S. simplex, *Don Prodr* 48, and *in Trans Linn Soc* xviii 530, leaves amplexicaul ovate cordate glaucous beneath, flowers solitary or 2 nate *Baker in Journ Linn Soc* xiv 591 S candidus, *Wall Cat* 5572 Helonima candida, *Kunth Enum* iv 204

T...
F...
man...
filifo...
anth...
diam, 5 ... seeded

6 SMILACINA, *Desf*

Rootstock short, or creeping *Stem* simple, leafy above *Leaves* alternate, subsessile, rarely petioled, ... nal racemes or panicles, small shortly ... eg ments subequal, usually deciduou ... to the bases of the segments, filar ... ite, globose, dorsifixed *Ovary* subglobose, 3 celled, style long or short, stigma entire or 3 fid, cells 2 ovuled *Berry* globose Seeds 1 or few, globose, testa thin, adnate, embryo about half the length of the seed —Species about 20, Europe, temp Asia and America

* *Flowers racemose*

1 **S. oligophylla,** *Hook f*, stem and leaves beneath and rachis of raceme puberulous leaves 3 in, pedicels solitary, perianth segments pale purple oblong lanceolate Tovaria oligophylla, *Baker in Journ Linn Soc* xiv 565

SIKKIM HIMALAYA, woods at Lachen alt 10–13,000 ft *J D H*

Rootstock stout, creeping *Stem* ½ 1 ft, flexuous above, slender *Leaves* 3–5 in, oblong, acute, or acuminate membranous pale and costate beneath, with many slender nerves *Raceme* 10 20 fld, 2 3 in, shortly peduncled, pedicels ⅛–¼ in, bracts deltoid *Perianth* ⅛ in long *Style* very short

2 **S. pallida,** *Royle Ill* t 380 stem stout, leaves beneath and rachis of raceme densely puberulent leaves 4 6 in pedicels solitary or 2 nate, perianth segments white oblong S purpurea *Wall Cat* 4201, *Plant As Rar* ii 38 t 144 S albiflora *Wall Pl As Rar* ii 38 Tovaria pallida, *and* purpurea, *Baker in Journ Linn Soc* xiv 566 Jocaste purpurea *and* albiflora *Kunth Enum* v 155

TEMPERATE HIMALAYA alt 8 11 000 ft, from Garwhal eastwards to Sikkim

Stem 2–3 ft very stout naked below, flexuous above *Leaves* 8-12 oblong, 4–6 in, acute pale beneath with 7 9 principal nerves *Raceme* 3–6 in, rachis sub erect, pedicels ⅛–¼ in bracts deltoid *Perianth* ⅛ in long, purple or white *Filaments* deltoid *Style* very short

** *Flowers in thyrsiform panicles*

3 **S. fusca,** *Wall Pl As Rar* iii 37, t 257, nearly glabrous, ... th brown- ... 4202 S ... sca, *Baker* ... v 155

TEMPERATE HIMALAYA alt. 6–8000 ft from Nepal, *Wallich*, to Sikkim and Bhotan KHASIA HILLS, alt. 5–6000 ft

Stem 1 2 ft. slender *Leaves* 3-6 in, membranous, glabrous or sparsely pilose beneath, petiole ¼ 1½ in, nerves 5–7 *Panicle* 3-6 in, peduncle short, branches flexuous lax fld, pedicels ¼–½ in solitary bracts minute *Perianth* ¼ in. diam. *Filaments* deltoid. *Style* very short. *Berry* ¼–⅓ in, 1 3 seeded.

4 **S. oleracea,** *Hook f & Thoms Herb Ind Or*, stem leaves beneath and panicle pubescent, leaves subsessile oblong lanceolate acuminate, panicle oblong or deltoid, perianth white, segments oblong obtuse *Bot Mag* t 6313 Tovaria oleracea, *Baker in Journ Linn Soc* xiv 56?

SIKKIM HIMA...

Rootstock sho...
and 6–9 nerved...
pedicels $\frac{1}{6}$–$\frac{1}{3}$ in...
Style very short,...
Lepchas of Sikkim

7 THEROPOGON, *Maxim*

Rootstock branched with thick root fibres *Leaves* radical, linear, bases enclosed in sheaths, costate *Scape* axillary from the lower leaves, naked *Flowers* in a terminal raceme, small, rose-cold, nodding *Perianth* globosely campanulate, segments subequal, broadly ovate, broadly imbricate *Stamens* inserted at the base of the segments, included, filaments short, broadly obovoid, fleshy, incurved, anthers basifixed between the lobes ovoid, acute, cells spreading over the top of the filament, erect *Ovary* sessile, style filiform, acute, stigma minute, cells 6–10 ovuled *Berry* subglobose *Seeds* few or several, subglobose, testa thin adnate, embryo straight or curved

1 **T. pallidus,** *Maxim in Bull Acad Petersb* xv 89, *Baker in Journ Linn Soc* xiv 562, *Bot Mag* t 6154 Ophiopogon? pallidus, *Wall Cat* 5138, *Kunth Enum* v 200 O brevifolius, *Royle mss* ? O mollis, *Royle Ill* 382 (name)

TEMPERATE HIMALAYA from Kumaon, alt 6000 ft to Sikkim, alt 6–10 000 ft KHASIA HILLS alt 5–6000 ft

Habit of an *Ophiopogon* *Leaves* 6–10 in, erect and recurved, grassy, acuminate persistent costa stout, green above glaucous beneath *Scape* shorter than the leaves acutely angled *Raceme* 2–3 in, pedicels $\frac{1}{4}$ $\frac{1}{2}$ in, solitary jointed under the perianth bracts green, subulate *Flowers* $\frac{1}{4}$ in diam drooping, white suffused with pink *Berries* $\frac{1}{4}$ in diam —Maximowicz describes the foliage as annual

8 TUPISTRA, *Ker*

Rootstock tuberous or creeping *Leaves* radical petioled, oblanceolate, costate, strongly nerved *Scape* short or long, flowers spicate, lurid *Perianth* campanulate, tube broad, lobes 6 or 8 short *Stamens* 6 or 8, inserted in the middle of the tube, included, filament very short inflexed, anthers dorsifixed incurved *Ovary* small sessile, subglobose, 3–4 celled, style very short stigma peltate or capitate, entire or 3–6 lobed, cells 2 ovuled *Berry* globose usually 1 seeded *Seeds* large, testa thin adnate, albumen fleshy —Species 7 or 8, tropical Himalayan and Burmese

* *Bracts shorter than the flowers*

1 **T. nutans,** *Wall in Bot Reg* t 1223, *Cat* 5793, spike pendulous densely many fld, flowers dull brown and purple, perianth lobes broadly ovate mouth closed by the large hemispheric stigma *Bot Mag* t 3054, *Kunth Enum* v 318 T squalida, *Baker in Journ Linn Soc* xiv 580 (*in part*)

SIKKIM HIMALAYA alt 1–5000 ft, *J D H* KHASIA HILLS alt 2–4000 ft, *Wallich, &c*

Rootstock as thick as the little finger *Leaves* 2 3 ft by 2–$2\frac{1}{2}$ in, narrowly oblanceolate, acuminate, coriaceous, shining, petiole as long as the blade or shorter *Peduncle* $1\frac{1}{2}$–4 in stout, decurved, spike 3 6 in, bracts deltoid, scarious *Flowers* $\frac{1}{2}$–$\frac{2}{3}$ in diam, tube hemispheric longer than the lobes *Berry* $\frac{3}{4}$ 1 in diam

ike pendulous
lobes broadly
ostigma tupis
5o7 130 t 192

KHASIA HILLS 3 4000 ft *Griffith* &c
Except by the characters g ven above I cannot separate th s from *nutans* and in the dr ed state tl ey are und st ngu shable —Gr ffitl s is a mucl exaggerated draw ng

3 **T Clarkei,** *Hook f* spike decurved or pendulous dense fld perianth lobes oblong mouth not closed by the stigma style long

SIKKIM HIMALAYA alt 2–5000 ft *J D H Clarke Treutler*
Apparently a much larger plant than tl e above w tl leaves 4–5 by 2 3½ in and larger flo ve s of a pale green sh yellow or purpl sh colour

4 **T. Stoliczkana,** *Kur in Journ As Soc Be g* 1875 ii 199 spike elongate erect perianth lobes linear lanceolate style very short stout stigma large scabrid

BURMA Moul ne n *Stol c ka*
Leaves 2½–3 ft by 4–5 in pet ole 1 1½ ft *Spike* 1 ft robust peduncle 4 in *Flowers* ⅓–½ in d am

** *Bracts lo iger than the flo ers*

5 **T aurantiaca,** *Wall Cat* 5194 leaves sessile narrowly oblan ceolate spike subsessile Campvland a aurantiaca *Baker in Journ Linn Soc* xiv 582 t 20

SUBTI OPICAL HIMALAYA from Nepal *Wa l ch* &c eastward to M sl m alt 4 6000 ft KHASIA and NAGA H LLS lt 4 8000 ft *G iffith* &c
Rootstock as tl ck as tl e l ttl fi ger roots very long and stout *Leaves* 1² 18 by 1 1½ in flacc dly cor ac ous *Peduncle* very sl ort and stout *Spike* erect 1–1½ i lo g oblong lense fld l racts 1 in lanceolate spread ng *Flowers* ⅓ in d am ye l w per anth tube hem spher c lobes short nearly orb cular style sl ort st g a large 3 l *Berry* ½ n d an globose

6 **T Wattii,** *H ok f* leaves petioled elliptic lanceolate or ovate acuminate spikes subsessile Campylandra Wattii *Baker in Journ L in S c* xxv 78 t 3?

BHOTAN HIMALAYA *Gr ffith*. MUNNIPORE alt 6–7000 ft *Watt Clarke*
Stem stout fl sl y 6–10 i from a lo g fleshy prostrate rh zome *Leaves* 4 12 by 1½–3 in *Peduncle* very short stout *pike* 1–3 in dense fld bracts l near lanceolate; flowers yellow *Berry* 1½ n d am 1 seeded

7 **T. singapureana,** *Wall Cat* 519 leaves petioled elliptic lanceolate acuminate membranous spike sessile elongate stout erect, bracts much longer than the globose fruit. *Baker in Journ Linn Soc* xiv 581

SINGAPORE *Wallich*
Stem sl ort erect as th ck as the finger *Leaves* 10–16 by 2 2½ in. erect pet ole 3 6 in stout r bbed *Spike* 3 in bracts ½ in., lanceolate membranous. *Berries* globose ½ in d am —Wall ch s sol tary specimen is in fruit only Kurz (Journ Beng As Soc 1875 i 199) who had not seen the plant th nks it may be a *H por dea* or *Apostas a* but I see no reason to doubt its be ng a *Tupistra*.

9 ASPIDISTRA, Ker

tetramerous,
base of the

A. longifolia, *Hook f*, leaves 2-3 ft by 1-2 in narrowly linear oblanceolate, bracts 2-3 hemispheric strongly nerved A lurida, *Baker in Journ Linn Soc* xiv 579, *not of Ker*

UPPER ASSAM, in the Mishmi hills, *Griffith*
Rootstock stout creeping *Leaves* tufted, rather thin, contracted into a rigid

10 GONIOSCYPHA, *Baker*

Leaves radical, petioled, oblong lanceolate, acuminate, costate and strongly nerved. *Scape* radical, bracts elongate subulate much exceeding the flowers, spike erect cylindric, crowned with a tuft of flowerless persistent bracts *Perianth tube* cylindric, lobes 6, short, broadly ovate, spreading *Stamens* 6, inserted in the throat of the perianth, filaments very short, anthers erect linear oblong *Ovary* subglobose, 3 celled, style columnar, stigma small, 3 lobed, cells 2 ovuled

G. eucomoides, *Baker in Journ Linn Soc* xiv 581, t 19, *N E Br in Gard Chron* 1886, ii 744

BHOTAN HIMALAYA
Rootstock long fleshy
long subpinnately 10-12
scarious sheaths spikes
flowers at length deflexed,
fleshy, 1-seeded

10* HEMEROCALLIS *Linn*

Species 5, Europe temp Asia and Japan

H. fulva, *Linn Sp Pl* Ed ii 462, inner perianth segments much

t 28

The HIMALAYA and KHASIA HILLS; possibly indigenous; cultivated throughout INDIA —DISTRIB S Europe, the Caucasus and N Asia to Japan

Leaves 12–24 by 1–1½ in, erecto-patent, acute, subglaucous beneath. *Scape* 2 3 ft, panicle 6–12-fld, pedicels short, bracts small, membranous *Flowers* nodorous, 1–2 in diam, tube yellow-red, outer segments orange yellow, oblong, acute, inner very much broader

Var *angustifolia*, Baker l c.; much smaller, leaves 12–18 by ½–¾ in, perianth-segments narrower more acute *Boiss l c* H longituba, *Miquel Ann Mus Lugd Bat* iii 152

11 DRACÆNA, *Linn*

Shrubs or trees *Leaves* alternate or crowded and subterminal, sessile or petioled, costate or not and many-nerved *Flowers* in terminal racemes panicles or heads, bracts small *Perianth tubular, campanulate* or funnel-shaped, 6 cleft, lobes narrow *Stamens* 6, inserted at the base of the tube, filaments filiform or flattened, anthers versatile. *Ovary* 3-celled, style filiform, stigma capitate, ovules 1, erect in each cell *Berry* globose didymous or 3 lobed *Seeds globose* or angled, testa thickish, albumen horny, embryo small —Species about 35, in warm regions of the Old World.

This genus wants a thorough revision on living plants The following attempt to delimit the Indian species has been a work of much labour and the result is provisional only

* Leaves linear or ensiform, sessile

1 **D. angustifolia,** *Roxb Fl Ind* ii 155, stem erect, leaves 8–20 by ¾–1 in costate waved, panicle very large decurved spreading, flowers ½–1 in, pedicels ⅛–¼ in, fruit ½ ¾ in diam fleshy *Wall Cat* 5141, *Kunth Enum* v 4, *Regel Revis Drac* 36, *Baker in Trim Journ Bot.* 1873, 262, *in Journ Linn Soc* xiv 526, *Kurz For. Fl* ii 543 D ensifolia, *Wall Cat* 5143, *Kunth Enum* 5, *Kurz l c* Terminalia angustifolia, *Rumph Amb* iv t 35 Sansevieria fruticosa, *Blume Enum* i 11

SILHET, *Wallich*, &c KHASIA and NAGA HILLS, common. BURMA, ANDAMAN ISLANDS, *Kurz* —DISTRIB Malaya, Australia

Stem 8–10 ft, as thick as a stout cane, simple or forked. *Leaves* sessile by a broad sheathing base, spreading and recurved *Flowers* white or tipped with pink. *Fruit* orange-cold —Kurz distinguishes his *ensifolia* by the panicle nodding longer than the leaves, bracts acute almost wholly scarious, filaments orange, pedicels ½ in, and *angustifolia* by the erect stiff panicle shorter than the leaves, bracts with a scarious border, filaments white

2 **D. graminifolia,** *Wall Cat* 5149, leaves 8–12 by ¼–½ in. obscurely costate, raceme erect simple or branched at the base quite smooth; flowers ½ in long D Finlaysonii, *Baker in Trim Journ Bot.* 1873, 261, *in Journ Linn Soc* xiv 525

STRAITS of MALACCA Dinding Island *Finlayson* —DISTRIB Borneo ?.

Wallich's specimens are very insufficient, and I hesitate to regard the Bornean plant, from which Baker's description is in part taken, as specifically the same

3 **D. granulata,** *Hook f*, arboreous, leaves 6–10 by ½ in sessile, panicle erect pyramidal, rachis and branches finely granulate when dry, fruit ½–1¼ in diam shortly pedicelled fleshy.

MALAY PENINSULA; Perak, *King's Collector.*

Stem 50–60 ft. by 18–20 in. diam.

4 **D. brachyphylla,** *Kurz For Flor* ii 544, a low shrub, leaves ½-1 ft costate, panicle erect stiff quite smooth shorter than the leaves, flowers ⅜ in, filaments white D atropurpurea, *var* Kurzii, *Baker in Journ Linn Soc* xiv 533

ANDAMAN ISLANDS, frequent, *Kurz*

I have seen only very imperfect specimens Kurz describes the stem as thick *as a goose quill or twice as thick*

5 **D. brachystachys,** *Hook f*, leaves 3 ft by 2 in ensiform coriaceous costa beneath very stout branches of panicle scaberulous spreading, flowers shortly pedicelled ternately fascicled

PENANG Moniatri road *Curtis* 2302

Stem 10-12 ft, 2-3 in diam *Leaves* fascicled *Panicle* apparently very large with rather distant horizontal strict branches bracts very small *Flowers* in rather remote fascicles ⅜ in long white, pedicel $\frac{1}{12}$ in —Described from one leaf and a portion of a panicle

** Leaves elliptic lanceolate or oblanceolate (very narrowly in D Porteri)

† Flowers in spiciform racemes that are simple or branched at the base only

6 **D. Porteri,** *Baker in Trimen Journ Bot* 1873 262, *in Journ Linn Soc* xiv 529, shrubby, leaves 8-10 by 1-1¼ in sessile narrowly lanceolate or oblanceolate costate towards the base, raceme shortly peduncled erect, flowers ¾ in long pedicels very short, fruit pisiform D maculata, *Wall Cat* 5748 (*not of Roxb*)

PENANG *Porter King's Collector* SINGAPORE, *Wallich*. MALACCA, *Griffith*

spicata, but with narrom Singapore may be

7 **D. spicata,** *Roxb Fl Ind* ii 157, arboreous, leaves 6-18 by 1½-2 in very broadly petioled elliptic or broadly oblanceolate finely acuminate, raceme long or short simple or branched at the base, flowers fascicled very shortly pedicelled fruit pisiform ½ in diam, or 3 lobed and ¾ in fleshy *Kunth Enum* v 10, *Wall Cat* 5146, *Regel Revis Drac* 44, D Wallichii, *Kunth in Act Acad Berol* 1842, 26

SILHET *Wallich*

I am unable to

flora, which howeve

Baker (*Journ Bot*

crimson

8 **D. terniflora,** ler te, gel

SILHET, CACHAR, the KHASIA HILLS, MUNNIPORE, CHITTAGONG, and the DECCAN PENINSULA *Roxburgh* and ? MALAY PENINSULA

According to Roxburgh and Kurz this is distinguished from *D spicata* by size and habit and the petioled leaves and according to Kurz, by the perianth 6 cleft [illegible]

Var *Heyneana*, spike or panicle much shorter than the leaves D Heyneana, *Wall Cat* 5754 D terminalis, *Wight Ic t* 2054 —Western Ghats, from the Concan southwards *Heyne* &c

Var ? *Thwaitesii*, spike or panicle very short, flowers smaller ½ in long D Thwaitesii *Regel Revis Drac* 44, *Baker ll cc* D elliptica, *Thunb & Dallm Diss* 3 (the Ceylon plant), *Thwaites Enum* 338 —Ceylon, ascending to 4000 ft

Var ? *Curtisii* stem short, leaves 4–6 in elliptic sessile squarrosely spreading and recurved elliptic lanceolate caudate acuminate, raceme much longer than the leaves slender long peduncled flowers 1 in long very slender —Penang, at Polo Boolong *Curtis*

9 **D. pachyphylla,** *Kurz For Fl* ii 546, shrubby 1–2 ft, leaves 4–6 by 1½–2½ in coriaceous subulate acuminate costate lower long-petioled raceme subsessile very short or elongate, flowers very shortly pedicelled, berries pisiform or 3 lobed

ANDAMAN ISLANDS *Kurz* PERAK, *King's Collector* MALACCA, on Mt Ophir, *Hullett* —DISTRIB Borneo

Resembles a dwarf *D spicata* "*Stem* sometimes as thick as the little finger, leaves often blotched flowers ¾ in long white, 6 cleft almost to the base, lobes conniving not recurved except the tips, tube not twisted, berries red," *Kurz*

†† Flowers in spreading panicles

§ *Panicle large rachis and branches very stout*

10 **D. aurantiaca,** *Wall Cat* 5744, stem very stout, leaves 12–18 by 2–4 in oblanceolate acuminate narrowed into a very broad almost flat petiole, costa broad obscure panicle 12–18 in, peduncle very short stout, pedicels ¼–⅓ in flowers densely clustered ¾ in D spicata var aurantiaca (in part) *Baker in Trim Journ Bot* 1873 263, and *in Journ Linn Soc* xiv 532 ? D marmorata, *Baker in Bot Mag* t 7078

SINGAPORE, *Wallich, Cantley* MALACCA *Maingay* (*K d* 1689)

Apparently arboreous I doubtfully refer Baker's *D marmorata* to Wallich's *aurantiaca* Wallich's name may imply that either the flowers or fruit of his plant are orange yellow The flowers of *D marmorata* are white, and the leaves mottled with white I have seen fruit of neither

11 **D. Maingayi,** *Hook f*, stem tall stout, leaves 8–12 by 1–2 in [illegible] middle, [illegible], berries [illegible] in *Trim* [illegible]

MALACCA, at Pulo Bissom, *Griffith* (*Kew Distrib* 5873), *Maingay* (*K d* 1683) PERAK, on low hills, *King's Collector*

"Tree 30–40 ft, stem 1½–2 ft diam, fruit waxy yellow," *King's Collector* "Fruit scarlet," *Griffith* The very narrow long petioled leaves distinguish this from *D aurantiaca*, and the large stout pyramidal panicle and large berries from *D spicata*

13 ASPHODELUS, *Linn.*

Annual, or perennial, root fibres slender or fleshy *Leaves* radical, linear, triquetrous, or terete and fistular *Flowers* racemed, solitary in the bracts *Perianth* white, marcescent, 6 partite, segments conniving in a tube below *Stamens* 6 hypogynous, filaments dilated at the base and ... dorsifixed versatile anther ...d, ovules 2 collateral in ... *Seeds* 3 quetrous testa ... cartilaginous albumen —

1 **A. tenuifolius,** *Cavan in Anal Cienc Nat* iii 46, t 27, and *Icon* t 587, f 2, annual, leaves slender semi terete fistular and scape smooth or papillosely scaberulous, pedicels jointed below the middle, perianth segments white with a brownish costa, filaments fusiform towards the tip *Kunth Enum* iv 558 A æstivus, *Reichb Ic Crit* t 451 A microcarpus *Reichb Ic Fl Germ* t 513 A clavatus, *Roxb Fl Ind* ii 148, *Wall Cat* 5058, *Kunth* l c 559 A parviflorus, *Wight Ic* t 2062 (bad pauciflorus, *in text* vi p 27) A fistulosus, var tenuifolius, *Baker in Journ Linn Soc* xv 272 A tenuifolius, var micranthus *Boiss Fl Or* v 314

Pla ... Guzerat and the Punjab —Dis ...

Lea ... *Scape* $1\frac{1}{2}$–3 ft, terete, often ... fld pedicels $\frac{1}{6}$–$\frac{1}{4}$ in *Periant* ... *Seeds* t ... Baker ... especial ... figure ... for the ... Coast of the Deccan

2 **A. comosus,** *Baker in Gard Chron* 1887, i 799 leaves ensiform 18 by $1\frac{1}{2}$ in, peduncle very stout racemes panicled dense fld

LAHUL, in the Rolang Pass *Jaeschke*

Habit of *A albus* and *ramosus* *Leaves* rather thick *Peduncle* 2 ft, panicle 1 ft, pedicels $\frac{1}{6}$–$\frac{1}{4}$ in, ascending jointed below the middle bracts $\frac{1}{2}$ in, much longer, scarious *Flowers* 1–$1\frac{1}{4}$ in diam, segments linear oblong, white with a green keel *Stamens* $\frac{1}{3}$ in longer than the perianth style as long

14 EREMURUS, *Bieberst*

Stately herbs, with the characters of *Asphodelus*, from which the genus differs only in the usually more numerous ovules —Species about 20, oriental and Northern Asian

1 **E. himalaicus,** *Baker in Journ Linn Soc* xv 283, glabrous, bracts subulate lanceolate equalling the pedicels flowers white, filaments as long as the perianth, capsule rugose, seeds not winged

TEMPERATE WESTERN HIMALAYA, in the drier regions, from the Sutlej westwards, alt 7–10,000 ft —DISTRIB Eastern Turkestan

Leaves 1–3 ft by ½–3 in *Scape* and *raceme* very stout, 2–3 ft, pedicels ¾ in, bracts subulate filiform *Flowers* 1 in diam, segments oblong, 1 nerved, about equalling the filament *Capsule* ½ in diam *Seeds* triquetrous

2 **E. persicus,** *Boiss Diagn* vii 119, *Fl Orient* v 326, puberulous, bracts ovate lanceolate shorter than the pedicels flowers white, filaments shorter than the perianth, capsule smooth small broadly winged *Baker in Journ Linn Soc* xv 284 Asphodelus persicus, *Jaub & Spach Ill Pl Or* t 102

NORTH WEST INDIA, Salt range, Mt Sikesa, alt 4–5000 ft, *Aitchison* — DISTRIB Affghan, Persia Syria

Leaves 6 12 by ⅙–½ in *Scape* 10 24 in, simple, stout *Raceme* 6–12 in, bracts ½ in scarious pedicels 1 in fruiting 2½ in horizontal *Flowers* ¾ in diam, segments white with a brown central band *Capsule* 1 in broad *Seeds* black, broadly 3 winged —Very variable in stature and in length and breadth of the leaves

15 CHLOROPHYTUM, *Ker*

Characters of *Anthericum* but capsule trigonous deeply laterally 3 lobed with flattened lobes —Species about 40, tropical and subtropical

The species are most difficult of circumscription owing to the great variability in the leaves and length and robustness of the scapes and racemes

* Flowers in simple or shortly branched dense fld racemes

† *Leaves lanceolate or oblanceolate, if fully developed*

1 **C. Heyneanum,** *Wall Cat* 5060, scape stout shorter than the leaves naked racemes short dense fld anthers shorter than the filaments, cells of the oblong capsule 8–10 seeded C Heynei, *Baker in Journ Linn Soc* xv 322 C breviscapum, *Thw Enum* 339

The DECCAN PENINSULA *Heyne &c*, Nilghiri hills, alt 6000 ft *Clarke* CEYLON common in the central province

Root fibres tuberous *Leaves* 12 18 by 1–1½ in, oblanceolate, petiole 2–4 in *Scape* ½–1 in, bracts longer than the small flowers, pedicels ⅙–¼ in, jointed near the tip *Perianth segments* ¼ in, narrowly lanceolate *Capsule* ¼ in long *Seeds* black shining

2 **C. breviscapum,** *Dalz in Hook Kew Journ Bot* ii 141, scape naked shorter than the leaves, raceme dense fld, anthers as long as the filaments cells of the orbicular or obcordate capsule 1–3 seeded *Dalz & Gibs Bomb Fl* 252

SIKKIM HIMALAYA, at the foot of the hills (fl only), *Clarke* The CONCAN, at Malwan *Dalzel*

Root fibres tuberous *Leaves* 12 by ½ 1½ in, linear lanceolate broadly petioled, margins often crispulate *Scape* stout, 3 6 in, rarely branched, raceme 3–5 in, bracts shorter than the flowers, pedicels ⅙–¼ in jointed above the middle *Perianth segments* ⅙–¼ in, linear-oblong *Capsule* ¼ in broad, seeds subglobose black opaque —Differs from *C attenuatum* in the broader leaves and short scape

3 **C. arundinaceum,** *Baker in Journ Linn Soc* xv 323, *in Gard Chron* 1876, 260, scape usually tall naked raceme elongate simple or shortly branched anthers longer than the filaments cells of the small orbicular capsule 3–4 seeded Phalangium alatum, *Herb Ham in Wall*

10 **C. orchidastrum,** *Lindl in Bot Reg* t 813, *in Trans Hort Soc* vi 79, scape tall naked paniculately branched, branches spreading, bracts small, flowers in distant pairs, cells of the broad small capsule 1 seeded *Kunth Enum* iv 603, *Baker in Journ Linn Soc* xv 325 C Nimmonii, *Dalz in Hook Kew Journ Bot* ii 142, *Dalz & Gibs Bomb Fl.* 252 Anthericum Nimmonii, *Grah Cat Bomb Pl* 220 Hartwegia Nimmonii, *Dalz mss* Phalangium oligospermum, *Wight Ic* t 2038

The DECCAN PENINSULA, from the Concan southward to Travancore —DISTRIB. Tonkin, Trop Africa

Root fibres tuberous *Leaves* 12 24 by 1½–4 in, elliptic-lanceolate *Scape* 1–3 ft, branches long ascending bracteate at the base, bracts ovate, flowers geminate drooping, pedicels ¼ ½ in jointed about the middle *Perianth segments* ½ in, white *Capsule* ⅓ in diam, broader than long, 2 lobed at the tip *Seeds* solitary, orbicular or oblong, flat, opaque

11 **C. laxum,** *Br Prodr* 277, leaves subdistichous usually strongly recurved, scape filiform flexuous, flowers minute, anthers didymous many times shorter than the filaments, cells of broadly obcordate capsule 1–4-seeded *Kunth Enum* iv 603 C laxiflorum, *Baker in Journ Linn Soc* xv 328, *Benth Fl Austral* vii 60 C falcatum *Baker in Saund Refug Bot* t 333 C parviflorum, *Dalz in Hook Kew Journ* ii 141, *Dalz & Gibs Bomb Fl* 251, *Thw Enum* 339 C abyssinicum, *Kotschy & Peyr. Pl Tinn* 46 Phalangium falcatum, *Wall Cat* 5057, *Kunth l c* 600 P? parviflorum, *Wight Ic* t 2309 Anthericum parviflorum, *Benth Fl Hongk* 373 Ornithogalum falcatum, *Herb Wight* Nolina? javanica, *Hassk Hort Bogor* 27, *Miquel Fl Ind Bat* iii 554

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rat

lanceolate, equalling the pedicels which are jointed in the middle *Perianth* white, segments ⅙ ¼ in, anthers green *Capsule* ⅛ in diam *Seeds* angular, $\frac{1}{16}$ in diam

DOUBTFUL AND IMPERFECTLY KNOWN SPECIES

12 C ACAULE, *Baker in Journ Linn Soc* xv 327, root fibres smaller, leaves 6–9 by ¼–⅓ in narrowly linear, flowers 2–5 in a sessile corymb at the bases of the leaves fruiting pedicels erect ¼–⅓ jointed, capsule ½ in oblong emarginate, cells turgid 3–5 seeded seeds rather tumid black opaque —India, *Jerdon* —The only specimen is flowerless It is perhaps a state of *C laxum*

PHALANGIUM NIVEUM, *Poiret Encycl* 248, *Kunth Enum* iv 599 Anthericum niveum, *Schult f Syst* vii 480, from India *Sonnerat* with long very dense fld spikes, snow-white bracts as long as the flowers and a scape 12 15 in, may be *attenuatum*

16 DIANELLA, *Lamk*

Roostock usually branched, ...
linear, bases often equitant
pedicels jointed at the top
spreading *Stamens* 6, hypogy
segments, filaments much thick
reflexed, opening by terminal pc
filiform, stigma minute, cells 4–8-ovuled *Berry* blue *Seeds* few, ovoid

or compressed, testa black, shining, albumen fleshy —Species 7 or 8, tropical Asiatic, Mascarene, Australia and Polynesia

D. ensifolia, *Redouté Lil* t 1, stem leafy, sheaths acutely keeled, filament greatly thickened at the very top *Kunth Enum* v 50, *Baker in Journ Linn Soc* xiv 576, *Benth Fl Austral* vii 16 *Bot Mag* t 1404, *Miquel Fl Ind Bat* iii 560, D odorata *Blume Enum* i 13, *Kunth* l c 51 D nemorosa *Lamk Encycl* ii 276, *Jacq Hort Schoenb* i 49, t 94 *Wall Cat* 5169, *Miquel l c*, *Roxb Fl Ind* ii 164 D javanica, *Kunth l c* 52, *Miquel l c* 561 D sandvicensis *Hook & Arn Bot Beech Voy* 97 Rhuacophila javanica *Blume l c* 14 Antherium Adenanthera, *Forst Prodr* No 149 Phalangium Adenanthera, *Poir Encycl* v 252

TROPICAL HIMALAYA from Nepal eastwards alt 2–5000 ft, the KHASIA

d

s

short, rigid, slender, bracts spathaceous, flowers inodorous *Perianth* white greenish or bluish, segments ¼–½ in, 3 inner reflexed *Anthers* linear 2 porose *Berry* dark purple, or blue, ¼ in diam, cells 1–3- or more seeded *Seeds* ovoid, subacute

17 ALLIUM, *Linn*

Fœtid scapigerous herbs, bulbs coated *Leaves* usually narrow, often fistular *Flowers* capitate or umbelled, all at first enclosed in 1–3 mem

in India —

A ASCALONICUM, *Linn*, *Roxb Fl Ind* ii 142 A Sulvia *Ham in Don Prodr* 53 A fragrans β nepalensis, *Bot Reg* t 898 Notloscordium? Sulvia, *Kunth Enum* iv 402, leaves basal and scape stout fistular head globose very many-fld, pedicels very short, perianth white stellate, inner filaments 2-toothed —The Shallot

A AMPELOPRASUM, *Linn* A Porrum *Linn Roxb l c* ii 141, *Wall Cat* 5074, stem leafy, leaves linear flat keeled shorter than the tall terete scape head globose very many and dense fld pedicels longer than the campanulate white flowers, inner filaments 2 toothed —The Leek

A CEPA *Linn*, *Roxb l c* 142, *Wall Cat* 5072 A Cumaria *Herb Ham*, leaves subdistichous fistular shorter than the inflated scape, head bearing flowers and bulbils, pedicels shorter than the stellate flowers sepals linear oblong filaments exserted simple or the inner 2 toothed at the base —The Onion

A SATIVUM *Linn*, *Roxb l c* 142, leaves flat, scape slender, spathes long-beaked heads bearing bulbils and flowers, sepals lanceolate acuminate, inner filaments 2 toothed —The Garlic

Sect I Schœnoprasum *Bulbs* free or clustered, not seated on a root stock *Leaves* and scape fistular or filiform *Stamens* inserted usually much above the base of the perianth, filaments dilated and connate at the base

* *Leaves fistular*

1 **A.** [illegible] *ll Monogr* 85, very long, head ate pale yellow included outer

Western Himalaya, alt 8–14,000 ft, from Kashmir to Garwhal —Distrib Alatau and Thian-chan Mts

Bulbs tufted, cylindric, scales membranous *Leaves* ¼–½ in diam, acute *Heads* 1½ in broad, spathes persistent *Sepals* ⅓–⅔ in

2 **A. Schœnoprasum,** *Linn Sp Pl* 301, leaves 1–2 slender, heads subglobose dense fld, pedicels equalling or shorter than the campanulate pink or pale purple flowers, sepals linear or lanceolate filaments included all simple filiform dilated at the base *Regel All Monogr* 77, *Baker in Journ Bot* 1872 292, *Boiss Fl Orient* v 250, *Reichb Ic Fl Germ* t 1085 A sibiricum *Linn Mant* 562

Western Himalaya alt 8 11,000 ft, from Kashmir to Kumaon —Distrib Westwards to the Atlantic N America

Bulbs clustered narrow, scales membranous *Leaves* 4–10 in, terete or grooved above smooth or scaberulous, sheaths elongate *Scape* 6–14 in, stout or slender *Sepals* ⅓–⅔ in bearing the stamens near their bases *Capsule* small, globose cells 2 seeded —Chives

3 **A. atrosanguineum,** *Schrenk in Bull Acad Petersb* x 355, leaves 1–2 stout as long as the scape, head subglobose dense-fld, pedicels about equalling the campanulate dark red flowers sepals oblong obtuse or subacute filaments short triangular subulate connate at the base *Ledeb Fl Ross* iv 168, *Kunth Enum* iv 684, *Regel All Monogr* 83

Western Himalaya Kashmir at Gilgit *Tanner* —Distrib Turkestan

Bulb narrow, coats membranous at length fibrous *Leaves* fistular, 8–12 by ⅙–¼ in, linear, obtuse, sheaths very long *Scape* stout, fistular *Head* ¾–1 in diam,

[illegible]

A. [illegible]

simple

Western Himalaya, Kashmir, at Barzil, alt 12 000 ft., *Clarke* —Distrib Turkestan

[illegible]

** *Leaves filiform.*

f .

Kunth l c 456 A Jacquemontii, *Kunth l c.* 399 A longisepalum, *Bert in Nov Comm Acad Bonon* v 429 A. tenue, *G. Don Monogr All* 34, *Koch in Linnæa*, xiii 238

The PANJAB and WESTERN HIMALAYA, alt 1500–8000 ft ; from Kashmir to Kumaon —DISTRIB Westwards to the Ural and Caucasus, and in Siberia

Bulb small, ovoid-oblong, outer coats striate, inner membranous *Leaves* 4–6,

iam , s the ier in *llasi*, isier's

arger, inum, vul- 00 ft

Westward to Persia

VAR γ parviflora, *Ledeb Fl Ross* iv 171, flowers smaller, sepals $\frac{1}{6}$ in long A. syntamanthum, *C Koch in Linnæa*, 22, 239; *Regel All Monogr* 110 — Western Himalaya Westward to S Russia

6 **A. lilacinum,** *Royle mss* , leaves terete or channelled longer or shorter than the scape, head hemispheric, pedicels twice as long as or

or ovate- the very 1874, 293

WESTERN HIMALAYA, alt 6–7000 ft , from Garwhal westwards

Bulb ovoid , coats scarious, red-brown *Leaves* 2–3 *Scape* 8–10 in , fistular *Head* 1–1½ in diam , spathes 2, acuminate, pedicels ¼ ½ in *Sepals* ¼ in long, with the filaments inserted near their bases , anthers large.

Sect II RHIZIRIDIUM *Bulbs* solitary or clustered upon an erect or creeping rootstock *Leaves* flat

A Scales of bulb membranous, not of reticulated fibres

* *Stamens longer than the perianth*

7 **A. blandum,** *Wall Pl As Rar* iii 38, t 260, tall, stout, leaves flat broadly linear obtuse shorter than the tall scape, head globose very ... campanulate pale pink flowers, sepals ... ite much exserted *Kunth Enum* 295. A. obtusifolium, *Klotzsch &*

Sect I SCHŒNOPRASUM *Bulbs* free or clustered, not seated on a root stock *Leaves* and scape fistular or filiform *Stamens* inserted usually much above the base of the perianth, filaments dilated and connate at the base

* *Leaves fistular*

1 **A. Semonovii,** *Regel Enum Pl Semenoff* 126, *All Monogr* 85, [illegible] very long, head [illegible] ate pale yellow [illegible] included outer [illegible]

WESTERN HIMALAYA alt 8–14 000 ft, from Kashmir to Garwhal —DISTRIB Alatau and Thian-chan Mts

Bulbs tufted, cylindric, scales membranous *Leaves* ¼–½ in diam, acute *Heads* 1½ in broad, spathes persistent *Sepals* ½–⅔ in

2 **A. Schœnoprasum,** *Linn Sp Pl* 301, leaves 1–2 slender heads subglobose dense fld, pedicels equalling or shorter than the campanulate pink or pale purple flowers, sepals linear or lanceolate filaments included all simple filiform dilated at the base *Regel All Monogr* 77, *Baker in Journ Bot* 1872 292, *Boiss Fl Orient* v 250, *Reichb Ic Fl Germ* t 1085 A. sibiricum *Linn Mant* 562

WESTERN HIMALAYA alt 8–11,000 ft, from Kashmir to Kumaon —DISTRIB Westwards to the Atlantic N America

Bulbs clustered narrow, scales membranous *Leaves* 4–10 in, terete or grooved above smooth or scaberulous, sheaths elongate *Scape* 6–14 in., stout or slender *Sepals* ⅓–½ in bearing the stamens near their bases *Capsule* small, globose, cells 2 seeded —Chives

3 **A. atrosanguineum,** *Schrenk in Bull Acad Petersb* x 355, leaves 1–2 stout as long as the scape, head subglobose dense fld, pedicels about equalling the campanulate dark red flowers, sepals oblong obtuse or subacute filaments short triangular subulate connate at the base *Ledeb Fl Ross* iv 168 *Kunth Enum* iv 684, *Regel All Monogr* 83

[illegible]

4 **A. Fedschenkoanum,** *Regel All Monogr* 82, leaves 1–2 much shorter than tall stout scape head globose dense fld, pedicels about equalling the campanulate pale yellow flowers, sepals oblong lanceolate acuminate, filaments very short inner with a dilated 2 toothed base outer simple

WESTERN HIMALAYA, Kashmir, at Barzil, alt 12 000 ft, *Clarke* —DISTRIB Turkestan

[illegible] *Scape* 2 3 ft [illegible] *Perianth-* [illegible] base, con- [illegible] short —The [illegible]

** *Leaves filiform*

[illegible] 261 leaves ½-terete or [illegible]

broad cuneate base inner broadest [illegible] *Kest* t 10 f 9, [illegible] *Orient* v 253, [illegible] florum, *Ledeb F* [illegible] *Kunth l c* 45[illegible] *Bert in Nov Comm Acad Bonon* v 429 A tenue, *G Don Monogr All* 34, *Koch in Linnæa* xxii 238

The PANJAB and WESTERN HIMALAYA, alt 1500–8000 ft, from Kashmir to Kumaon —DISTRIB Westwards to the Ural and Caucasus, and in Siberia

Bulb small ovoid oblong outer coats striate, inner membranous *Leaves* 4–6, [illegible]

Westward to Persia

VAR γ parviflora *Ledeb Fl Ross* iv 171, flowers smaller, sepals ⅙ in long A syntamanthum *C Koch in Linnæa*, 22, 239, *Regel All Monogr* 110 — Western Himalaya Westward to S Russia

6 **A. lilacinum,** *Royle mss*, leaves terete or channelled longer or shorter than the scape head hemispheric pedicels twice as long as or [illegible] vate [illegible] very [illegible] 293 (not of Schrad)

WESTERN HIMALAYA, alt 6–7000 ft, from Garwhal westwards

Bulb ovoid, coats scarious, red brown *Leaves* 2–3 *Scape* 8–10 in, fistular *Head* 1–1½ in diam, spathes 2, acuminate, pedicels ⅓–½ in *Sepals* ¼ in long, with the filaments inserted near their bases, anthers large

Sect II RHIZIRIDIUM. *Bulbs* solitary or clustered upon an erect or creeping rootstock *Leaves* flat

A Scales of bulb membranous, not of reticulated fibres

* *Stamens longer than the perianth*

7 **A. blandum,** *Wall Pl As Rar* iii 38, t 260, tall, stout, leaves flat broadly linear obtuse shorter than the tall scape, head globose very dense fld, pedicels shorter than the campanulate pale pink flowers, sepals oblong obtuse filaments simple subulate much exserted *Kunth Enum* iv 396, *Baker in Journ Bot* 1874 295 A obtusifolium, *Klotzsch & Garcke, Bot Reise Pr Wald* 51, t 95

Sect I SCHŒNOPRASUM *Bulbs* free or clustered, not seated on a root stock *Leaves* and scape fistular or filiform *Stamens* inserted usually much above the base of the perianth, filaments dilated and connate at the base

* *Leaves fistular*

1 **A. Semonovii,** *Regel Enum Pl Semenoff*, 126, *All Monogr* 85, very long, head ate pale yellow included outer

WESTERN HIMALAYA, alt 8–14 000 ft, from Kashmir to Garwhal —DISTRIB Alatau and Thian chan Mts

Bulbs tufted, cylindric, scales membranous *Leaves* ¼–½ in diam, acute *Heads* 1½ in broad, spathes persistent *Sepals* ½–⅔ in

2 **A. Schœnoprasum,** *Linn Sp Pl* 301, leaves 1–2 slender, heads r than the campanulate or lanceolate filaments *Regel All Monogr* 77, v 250, *Reichb Ic Fl*

WESTERN HIMALAYA alt 8 11,000 ft, from Kashmir to Kumaon —DISTRIB Westwards to the Atlantic, N America

Bulbs clustered narrow, scales membranous *Leaves* 4–10 in, terete or grooved above smooth or scaberulous, sheaths elongate *Scape* 6-14 in, stout or slender *Sepals* ⅓–½ in bearing the stamens near their bases *Capsule* small, globose, cells 2 seeded —Chives

3 **A. atrosanguineum,** *Schrenk in Bull Acad Petersb* x 355, dense-fld, pedicels epals oblong obtuse innate at the base *l All Monogr* 83

WESTERN HIMALAYA Kashmir at Gilgit *Tanner* —DISTRIB Turkestan

Bulb narrow coats membranous at length fibrous *Leaves* fistular, 8–12 by ⅙–¼ in, linear, obtuse, sheaths very long *Scape* stout fistular *Head* ¾–1 in diam, spathes persistent *Perianth* ½ ⅓ in long, segments united below, filaments sub equal inserted at ⅓ distance from their base, about ⅓ as long as the perianth *Ovary* globose style short —The Gilgit specimens have rather smaller flowers with more obtuse segments than the Turkestan

4 **A. Fedschenkoanum,** *Regel All Monogr* 89 [illegible]

simple

WESTERN HIMALAYA, Kashmir, at Barzil, alt 12 000 ft, *Clarke* —DISTRIB Turkestan

... ments much longer than the sepals, ... their bases, rather longer than the style

... slender ... head ... campanulate ... free ... longistamineum, Royle Ill 392 (name only).

WESTERN HIMALAYA, from Kashmir, alt 9000 ft ...

9 **A. consanguineum,** *Kunth Enum* iv 431, leaves slender narrowly linear obtuse flat keeled ... rather longer ... filiform much ... 131, *Baker* ...

WESTERN HIMALAYA Kashmir alt ... Jacquemont, Thomson, &c ... golden yellow, with filaments inserted on ...

10 **A. platyspathum,** *Schrenk Enum Pl Nov* i 7, ii 8, leaves radical linear obtuse about equalling the tall scape head subglobose pedicels about equalling the rosy flowers sepals oblong lanceolate obtuse or subacute, filaments simple bases dilated *Kunth Enum* iv 453, *Regel Monogr All* 135, *Ledeb Fl Ross* iv 184 (excl var β)

WESTERN TIBET, (Var β, only), *Herb Calcut* (Regel) —DISTRIB Kansu

Bulb solitary or clustered, on a short ...

11 **A. Thomsoni,** *Baker in Journ Bot* 1874, 294, leaves rather stout linear fleshy obtuse shorter or longer than the scape, head globose, pedicels equalling or shorter than the red purple campanulate flowers, sepals oblong lanceolate acute, filaments simple filiform much exserted, anthers minute *Regel All Monogr* 141

KASHMIR, alt 12 000 ft., *Thomson*

Bulbs tufted, narrowly ovoid, outer scales hard, chestnut-brown, entire *Leaves* 4 5, 6–9 by ⅓–½ in, sheathing the lower third of the stout terete scape, which is 1–2 ft long, tip rounded *Head* 1–1½ in diam ; spathes short deltoid *Sepals* ¼ in long, with the filaments on their bases *Ovary* globose, cells 2 ovuled, style

much exserted —Baker observes that this is closely allied to *A blandum*, differing in the slender habit, narrower leaves and longer more acute sepals

12 **A. Bakeri,** *Regel All Monogr* 141, leaves basal narrowly linear, scape tall slender, head lax fld, pedicels much longer than the campanulate red purple flowers sepals orbicular or oblong obtuse, filaments simple linear subulate inner dilated and 2 toothed at the base, anthers minute A splendens, *Miq Ann Mus Bot Lugd Bat* iii 154 A. exsertum *Baker in Journ Bot* 1874, 294 (*not of Don*) ? Caloscordon exsertum, *Herbert in Bot Reg* xxxiii *under* t 5

KHASIA HILLS, alt 4–5500 ft.—DISTRIB China, Japan

Bulbs clustered, 1 in long, ovoid-oblong, scales white membranous *Leaves* 2–4, 6–9 by $\frac{1}{12}$ in, shorter than the slender terete scape *Head* few or many fld, pedicels $\frac{1}{4}$–$\frac{3}{4}$ in *Sepals* $\frac{1}{6}$–$\frac{1}{4}$ in long with the filaments on their bases *Ovary* subglobose, style far exserted

** *Stamens equalling or shorter than the perianth*

13 **A. Wallichii,** *Kunth Enum* iv 443, tall leaves long linear or

of *Pallas*) A violaceum *Wall Liss*

TEMPERATE HIMALAYA, alt 8–13 000 ft from Kumaon to Sikkim Gilgit, *Tanner*

Bulbs hardly developed clustered, base of stem thickened clothed with membranous entire and torn sheaths *Leaves* basal 2–3 ft by $\frac{1}{4}$–$\frac{2}{3}$ in, margins erose, narrowed to an acute point *Scape* 1–$2\frac{1}{2}$ ft *Head* 2–3 in diam, pedicels 1–$1\frac{1}{2}$ in spathes caducous, as long as the pedicels *Sepals* $\frac{1}{2}$ in obtuse filaments inserted on their bases *Capsule* turbinate

14 **A. Hookeri,** *Thwaites Enum* 339, slender, leaves basal linear ... head ... white ... A.

KHASIA HILLS, at Kala Pana, alt 5000 ft, *J D H & T T* CEYLON, Newera Elia, alt 7000 ft, *Thwaites*

Bulb hardly any, base of stem clothed with long narrow membranous sheaths *Leaves* 12–18 by $\frac{1}{4}$–$\frac{1}{3}$ in, acute *Scape* 1–2 ft, heads $1\frac{1}{2}$ in diam, spathe with a long tail, pedicels $\frac{1}{2}$–$\frac{3}{4}$ in, capillary *Sepals* $\frac{1}{4}$ in, filaments inserted on their bases *Capsule* obcordate, cells usually 1 seeded

A. ... 1874, 292, leaves basal ... der flexuous scape, head ... the campanulate lilac ... horter than the oblong

SIKKIM HIMALAYA, in the inner ranges, alt 11–14 000 ft *J D H Elwes*

Bulbs tufted, slender, cylindric, outer scales of long parallel fibres *Leaves* 2–3, 3–4 by $\frac{1}{16}$–$\frac{1}{8}$ in subacute *Scape* 4–12 in *Head* 6–15 fld, pedicels $\frac{1}{12}$–$\frac{1}{4}$ in, spathe solitary, broadly ovate *Sepals* $\frac{1}{4}$ to nearly $\frac{1}{3}$ in, inner filaments with a broad triangular base adnate to the bases of the sepals, outer narrower free *Capsule* 3 lobed *Ovary* subglobose, style included, cells 2 ovuled —Baker regards

this species as intermediate between the smaller vars of *A* *angulosum* and *Schœnoprasum*

B Outer scales of the bulb of reticulated fibres, obscurely so in *tuberosum*

* *Stamens longer than the perianth*

16 **A. Jacquemontii,** *Regel All Monogr* 162, leaves basal filiform subterete shorter or equalling the slender strict scape, head globose or sub globose, pedicels shorter or longer than the lilac campanulate flowers sepals oblong lanceolate obtuse or subacute, filaments exserted subulate inner with a dilated 2 toothed base A junceum, *Jacquem mss*, *Baker in Journ Bot* 1874, 295 (*not of Smith*) A leptophyllum, *Wall Cat* 5073 B

WESTERN TIBET, alt. 12–14,000 ft *Jacquemont, Thomson*, north of Kumaon alt 16 500 ft., *Strachey & Winterbottom*

Bulbs tufted, cylindric, elongate, fibrous coats very finely reticulate, rusty brown *Leaves* 3–6 4 6 by $\frac{1}{24}$ in *Scape* 3–9 in *Head* 1–1½ in diam, spathes 2 membranous, pedicels $\frac{1}{12}$–$\frac{1}{4}$ in *Filaments* inserted much above the bases of the sepals, shortly exserted, inner obscurely toothed at the base *Capsule* globosely ovoid, style very long —Much eaten in Western Tibet Baker regards it as possibly a variety of the Siberian *A* *lineare*, which has broader leaves and much broader inner filaments

17 **A. auriculatum,** *Kunth Enum* iv 418, leaves narrowly linear flat obtuse stout shorter than the terete striate scapes, head globose very dense fld, pedicels about equalling the very small campanulate purplish flowers, filaments as long as the oblong obtuse sepals, outer broadly subulate inner auricled at the base, stigma penicillate, *Baker in Journ Bot* 1874 295

[illegible]

exa[illegible]
12-[illegible]
Sepals ⅛ in long, filaments on the base of the sepals, outer rather shorter than the inner *Ovary* subglobose

18 **A. victorialis,** *Linn Sp Pl* 295, leaves petioled elliptic to [illegible] n the terete scape, head [illegible] h longer than the stellate [illegible] simple longer than the [illegible] the middle to the base [illegible] *Regel All Monogr* 170, *Baker in Journ Bot* 1874, 291, *Boiss Flor Orient* v 215, *Jacq Fl Austr* iii t 216 *Reichb Ic Fl Germ* x t 508, *Redouté Lil* v t 265, *Bot Mag* t 1222 A. ellipticum, *Wall Cat* 5069, *Kunth l c* 456

[illegible] ashmir eastwards to Sikkim
[illegible] tock, subconic or cylindric, [illegible] om below the middle of the [illegible] narrowed into the petiole [illegible] diam, spathes 2, shorter [illegible] als ¼–⅓ in, spreading and reflexed, filaments inserted on the bases of the sepals outer narrowly subulate, inner

lanceolate *Ovary* broadly obcordate, style exserted *Capsule* ¼ in diam cuneately obcordate

Var *angustifolia*, leaves ⅙–1¼ in broad, flowers pale pink —Interior of Sikkim, alt 10–12 000 ft West Nepal, *Duthie*

19 **A. Schrenki,** *Regel All Monogr* 172 leaves linear flat shorter than the terete striate scape head globose, pedicels shorter than the purplish campanulate perianth, filaments simple shortly exserted

*** Stamens shorter than the perianth*

20 **A. odorum,** *Linn Mant* 62, leaves many basal very narrowly linear flattish keeled shorter than the terete slender scape head many or few fld, pedicels much or rather longer than the small white campanulate

...calaticum, *Ait Hort Kew ed* 2 ii 235

WESTERN TIBET, alt 10 14 000 ft, *Thomson*. WESTERN NEPAL alt 13 000 ft, *Duthie* —DISTRIB N Asia, Japan

Bulb 1–4 in clustered on an oblique jointed rootstock, subcylindric or conic, scales finely reticulate white brown or blackish *Leaves* many 6 24 by $\frac{1}{10}$ ⅛ in, ... diam spathes short, ... uiting 1¼ in *Sepals* ... dilated at the base, ... *Capsule* subglobose

21 **A. tuberosum,** *Roxb Hort Beng* 24 *Fl Ind* ii 141, leaves 4–5 basal erect narrow linear flat tall compressed or trigonous above, head lax fld pedicels much longer than the small white or pink stellate flowers sepals oblong lanceolate, filaments simple linear included connate below and perigynous, style short *Baker in Journ Bot* 1874 292 *Kunth Enum* iv 454 *Wall Cat* 5068 A Roxburghii, *G Don Monogr All* 91 *Kunth l c* 454 A uliginosum, *G Don l c* 60, *Kunth l c* 422 A senescens *Miq Ann Mus Bot Lugd Bat* iii 154

WESTERN HIMALAYA *Royle* KHASIA MTS alt 5–6000 ft (apparently wild) *Griffith* &c Cultivated in BENGAL *Roxburgh* —DISTRIB China Siam, Japan

Bulbs elongate cylindric with white fleshy root fibres scales grey ... *Leaves* 6–12 by $\frac{1}{12}$–⅙ in sometimes concave and twisted *Scape* 1–1½ ft *Head* 20–40 fld hemispheric 1 1½ in diam spathes 1 2 small pedicels ... in *Sepals* ⅙–¼ in acute or obtuse at length reflexed filaments inserted on the bases of the sepals gradually dilated from below the middle to the base ... shorter broader *Ovary* globosely obovoid, deeply 3 lobed, ... 3 toothed, cells 3 ovuled *Capsule* obcordate —Regel cites this as a synonym of A odorum, and it is possible that it may be the cultivated form of that plant Wallich's specimens are from the Mission Garden, Tranquebar

22 **A. Govanianum,** *Wall Cat* 5071, leaves many basal subdistichous linear flat obtuse about equalling the acutely angled scape, tip rounded head many fld, pedicels equalling or exceeding the white stellate flowers sepals narrow at length reflexed, filaments very short perigynous subulate included bases dilated connate *Baker in Journ Bot* 1874, 293, *Regel All Monogr* 177 *A. humile, Kunth Enum* iv 443, *Regel l c* *A nivale Jacquem mss*

TEMPERATE HIMALAYA, from Kumaon westwards, alt 8–12 000 ft

Bulbs and foliage as in *A odorum,* from which it differs in the acutely angled scape, in the larger flowers with narrower sepals ½ in long, and much shorter stamens —The name *humile* being quite inappropriate, except for a very dwarfed state, I follow Baker in retaining Wallich's, which commemorates the discoverer of the species

23 **A. oreoprasum,** *Schrenk in Bull Imp Acad Petersb* x 354, *Enum Pl Nov* ii 6, leaves basal narrowly linear flattish shorter than the striate scape, head few or many fld, pedicels longer than the rosy campanulate flowers sepals oblong obovate with a recurved mucro, filaments simple connate below the middle included, *Ledeb Fl Ross* iv 185, *Regel All Monogr* 180

WESTERN TIBET, Zalung-Karpo Pass, alt 10–17,000 ft, *Stoliczka* (Regel)—DISTRIB Soongaria, Eastern Turkestan

Bulb tufted, cylindric or elongate conic, outer scales rigid, appressed fibres strongly coarsely reticulated *Leaves* 8–12 by $\frac{1}{6}$–$\frac{1}{4}$ in, often minutely serrulate *Scape* terete or somewhat 2 edged above *Head* 1 1½ in diam, hemispheric, 6–12 fld, spathes 2 nearly as long as the pedicels which are $\frac{1}{4}$–$\frac{3}{4}$ in, tips thickened *Sepals* $\frac{1}{4}$–$\frac{1}{3}$ in long, midrib dark *Filaments* inserted much above the bases of the sepals, ⅓ shorter than these, all connate at the base, outer narrowly subulate, inner broadly subulate lanceolate *Ovary* globose, trigonous, style short, stigma capitate —Described from Turkestan specimens, I have seen no Indian

24 **A. Clarkei,** *Hook f*, leaves very many subbasal erect very narrowly linear or filiform shorter than the slender scape, head lax fld, pedicels much longer than the stellate white flowers, filaments hardly as long as the linear oblong acuminate sepals, inner broadly oblong obtusely-toothed below the middle

KASHMIR at Skardo, alt 7 11 000 ft, *Clarke*

Bulb small ovoid 1 in [illegible] *Leaves* 4–8, 6–12 by $\frac{1}{16}$ [illegible] diam, spathes 2 one or [illegible] *Sepals* ⅙ in., acuminate, [illegible] y sub-globose, style in [illegible] of *A. tuberosum*

SECT III MOLIUM *Bulbs* not seated on a rootstock *Leaves* flat or keeled *Spathes* shorter than the head

25 **A. atropurpureum,** *Waldst & Kit Pl Rar Hung* i 16, t 17, leaves 2–3 basal narrowly linear oblong or lanceolate shorter than the tall erect terete fistular scape, head large very many and dense-fld, pedicels much longer than the rose-purple stellate flowers, filaments subulate about equalling the linear oblong or lanceolate sepals, base of ovary 3 foveo ate *Regel All Monogr* 247 *Don Monogr All* 90, *Kunth*

Enum iv. 448, *Boiss Fl Orient* v 757, *Reichb Ic Fl Germ* x t 505 A. robustum, *Karel & Kiril Enum Pl Alt* n 855, *Kunth l c* 446, *Ledeb Fl Ross* iv 187, *Baker in Journ Bot* 1874 289

WESTERN HIMALAYA, from Kashmir, *Falconer* to Kishtwar, alt 8–10 000 ft, *Thomson* —DISTRIB Westwards to Hungary, Turkestan Siberia

Bulb subglobosely ovoid, scales entire *Leaves* 2–4, margins smooth, 1 2 ft by 1–2 in, sheaths sometimes hirtellous *Scape* 2–2½ ft, striate *Head* usually hemispheric, 2–2½ in diam spathes 2 4 apiculate, pedicels ½ 1 in, elongate in fruit *Sepals* linear oblong subacute, pale or dark purple, filaments inserted at their bases connate at the base, inner triangular below the middle, outer at the base only *Ovary* subglobose or depressed style short, stigma simple *Capsule* globose —Affghan specimens have leaves 2½ in broad

26 **A. loratum,** *Baker in Journ Bot* 1874, 290, leaves 3–5 linear-

WESTERN HIMALAYA and TIBET, Kishtwar and Banahal, alt 10 14,000 ft, *Thomson*

Bulb small, ovoid outer scales membranous, grey *Leaves* 2 5, 6–9 by ½ 1 in, narrowed from above the base *Scape* 3–6 in *Head* 30 50-fld, spathes 2, navicular, acute, pedicels ⅓–½ in, tip thickened *Sepals* ⅙–¼ in, midrib brown, filaments inserted on their bases *Ovary* globosely triquetrous, style very short —Baker says that this, judging from the very imperfect specimens, closely resembles *A narcissifolium*, Linn, the handsomest of European species Near *A atropurpureum* but the leaves are broader, and the head globose, with much shorter pedicels and paler flowers

SIKKIM HIMALAYA, in the inner ranges alt 12–13 000 ft, *J D H*, *Elwes*

Bulb narrow, coats membranous *Leaves* 6 9 18 by ½ ¾ in *Scape* robust, 1 2 ft, pedicels 1–2 in, stout *Sepals* ½ ½ in, filaments inserted on their bases, dilated at the very base, anthers large *Ovary* deeply 3 lobed, stigma capitellate —A very beautiful species, resembling *A narcissiflorum*, Vill Regel cites it in Sect *Rhizirdium*, but it is not known to have a rootstock

18 DIPCADI, *Medic*

Tuberous scapigerous herbs *Flowers* racemed. *Perianth* cylindric, ...out the middle, the inner ...e short, broad, tridymous, ...ck, membranous —Species

The Indian species want a thorough re-examination with far better mater... than I have access to

* *Ovary stipitate*

tips filaments dilated in the middle, style elongate U indica, *Wight Ic* t 2063 (sepals very incorrect) *excl Syn Kunth* Melanthium nudum *Herb Heyne in Wall Herb* (misspelt *indium* in Cat 5062 D)

** *Leaves and flowers appearing together*

4 **U. congesta,** *Wight Ic* t 2064 (*left hand figure*), leaves appearing with the flowers raceme many and dense fld, flowers small suberect, bracts minute deltoid perianth segments 1 nerved, capsule subglobose *Baker in Journ Linn Soc* xiii 218

DECCAN PENINSULA, on the sea coast *Wight* CEYLON, Dambulla, *Trimen*

Bulb about 1 in diam *Leaves* 5–6 in, filiform grooved above *Scape* 6 in, flexuous, raceme 2–3 in, pedicels $\frac{1}{12}$–$\frac{1}{8}$ in
and purplish, filaments flattened below
linear oblong large anthers *Capsule* $\frac{1}{3}$ in
is very incorrect in respect of the periant
(Journ Bot 1889, 167) differs in the laxer inflorescence

5 **U. polyphylla,**
longer than the very sl
auricles, sepals all thick
slender style elongate
Cat 5062 F

DECCAN PENINSULA? *Heyne*

Bulb not seen *Leaves* 8 10 by $\frac{1}{10}$ in, margins involute *Scape* longer than the leaves, very slender, raceme terminal 6-fld; bracts $\frac{1}{4}$ in, persistent, sepals $\frac{1}{4}$ in long, oblong lanceolate obtuse, filaments nearly as long as the sepals style as long —There is but one specimen in Herb Wall, without bulb, it resembles the Cape and European species, and is fastened down with *Urginea Wightiana* and *Dipcade serotina*

20 SCILLA, *Linn*

Bulbous, scapigerous herbs *Flowers* racemed *Perianth* persistent stellate or campanulate, segments recurved *Capsule* globose, 3 lobed or tridymous, loculicidal, cells 1–2 seeded *Seeds* obovoid or subglobose, testa thin, black —Species about 80, Europe, As temp

1 **S. indica,** *Baker in Saund Refug Bot* iii *App* 12, *in Journ*
ry many fld,
c l c Lede
36, *Wight Ic*
Gibs Bomb
t 171 L
maculata *Dalz in Hook Kew Journ* ii 143, *Dalz & Gibs l c* Barnardia indica, *Wight Ic* t. 2041 Melanthium hyacinthoides & Erythronium indicum, *Herb Madr*

The DECCAN PENINSULA and CENTRAL INDIA, from the Concan and Nagpore

southwards, especially near the sea. CEYLON, at Trincomalee, Gla...
Abyssinia

Bulb 1 2 in diam *Leaves* 3–6 in, very variable in breadth, ... often recurved, tips after reaching the ground bulbiferous, green or ... black *Scape* 2–6 in, raceme cylindric, 30–50 fld, pedicels ... minute *Flowers* greenish purple, filaments purple, ovary ... no characters of *L maculata*

2 **S. Hohenackeri,** *Fisch & Mey in Bull Soc Nat M...* 256, leaves linear, raceme few or many fld, perianth ¾ in ... *in Journ Linn Soc* xiii 244, *Boiss Fl Orient* v 227 ... var pluriflora, *Ledeb Fl Ross* iv 157 Hyacinthus ... *Botul* 212, *Ic Pl Asiat* t. 275

The PANJAB, *Ic Falconer*, Rawul Pindee at Hussan, ... Affghanistan, Persia

Bulb ovoid, ½–1 in diam *Leaves* 4–6 flaccid, 8–12 by ¼ ... in ... 6 12 fld, bracts membranous *Flowers* bright blue scattered ... obtuse, recurved from near the base, filaments narrowly lanceolate ... cells of ovary 3–4-ovuled

21 LILIUM, *Linn*

Seeds vertically compressed testa pale, membranous, appressed —Species about 50, N temperate

SECT I *Bulb* of narrow fleshy imbricating scales without any outer coats *Stamens* not diverging *Stigma* capitate, obscurely 3 lobed Eulirion

* Leaves petioled, broadly cordate

1 **L. giganteum,** *Wall Tent Fl Nep* 21 t 12 13 (*excl syn*), *Cat* 5075, very tall raceme many fld pedicels short, perianth white narrowly funnel-shaped *Kunth Enum* iv 268 *Bot Mag* t 4673 copied in *Fl des Serres* t 771–2 ... *Obs Gen Lis* passim *Baker* ... 1880, ii fig 18, *Elwes Monog* 52

TEMPERATE HIMALAYA, from Garwhal to Sikkim alt 5 10 000 ft KHASIA HILLS alt 5–6000 ft

Bulbs tufted, 3 4 in diam, scales subequal *Stem* 6 12 ft, 2 in diam at base, fistular *Leaves* 12 18 in long and broad penninerved, petiole of lower 9 12 in *Raceme* 1 2 ft, bracts large, flowers 5 7 in fragrant drooping tube ... within, segments oblanceolate tips rounded recurved *Stamens* and style included, filaments decurved at the tip anthers ½ in yellow *Capsule* 2 3 in, obtusely angled, carpels retuse, septa pectinate *Seeds* ½–¾ in broad, very thin

** Leaves sessile, linear or lanceolate

† *Flowers white or greenish white*

2 **L. Wallichianum,** *Schultes f Syst Pl* vii 1689, leaves narrowly

side, white within speckled with long purple streaks, segments oblanceolate, ¾ in broad; style very declinate

Sect III *Bulb* with dark brown scarious coats *Leaves* linear *Stamens* not spreading *Stigmas* 3 fid, lobes short, narrow, recurved NOTHOLIRION

10 **L. Thomsonianum,** *Royle Ill* t 92, stem 2–4 ft very many fld *Duchart Obs Gen Lis* 68 L roseum, *Wall Cat* 5077 B, *Belgic* ... *Gard Chron* ... , *Notul* 241, ... *oyle Ill* 388, ... *7 Or* v 191, *excl syn*

WESTERN HIMALAYA, alt 5 7000 ft, from Kumaon to Kashmir —DISTRIB Affghanistan

Bulb 2–2½ in, formed of lanceolate fleshy inner scales (bulbils) covered by dark brown loose scarious longitudinally undulate scales *Stem* very stout *Leaves* 8–12 by ⅓–½ in, flaccid, narrowed to very fine points *Raceme* dense-fld, 1-2 ft long, bracts lanceolate, pedicels short, stout *Flowers* 2-2½ in long sweet-scented, pale rose or rose-purple, segments narrowly spathulate, nectary 0 *Filaments* long; style much longer than the ovary tip upcurved *Capsule* 1 in

11 **L. roseum,** *Wall Cat* 5077 A, stem 12–20 in few fld *Duchart Obs Gen Lis* 68, *Bot Mag* t 4725 ... 1845, t 1 L Hookeri, *Baker in Ga*... Hookeri *Baker in Journ Linn Soc* xiv ... macrophylla *Don Prodr* 51 Notholir... under t 4725

TEMPERATE HIMALAYA Garwhal, at Mussoori (Bot Reg), Nepal, *Wallich*, Sikkim, alt 9 10 000 ft *J D H*

A much smaller plant than *L Thomsonianum*, with the bulb 1½ in long, the ... lilac, but Wallich was ... *son* was taken up as a ... whose mention of it as a ... *F macrophylla*, from ... meant for this plant,

DOUBTFUL SPECIES

22 FRITILLARIA, *Linn*

Characters of *Lilium*, but perianth campanulate or with segments spreading from near the naked or bearded base, nectaries usually broad, stigmas 3 fid with short spreading truncate divisions (as in Sect III of *Lilium*), *rarely capitate and 3 lobed —Species about 50, N* temp regions

* *Flowers solitary Perianth segments spreading from near the base, stigma capitate, 3 lobed*

1 **F. oxypetala,** *Royle Ill* 388, leaves elliptic lanceolate, perianth-

segments elliptic ovate acute, bearded above the nectary Lilium oxypetalum, *Baker in Journ Linn Soc* xiv 234, *Elwes Monog Lil* t 4, *left hand fig* ? F triceps, *Klotzsch Bot Reis Pr Wald* 53 t 93

WESTERN HIMALAYA, Kunawar *Royle*, Kumaon alt 12 500 ft, *Strachey & Winterbottom* Garwhal and W Nepal alt 10–11,000 ft *Duthie*

Bulb 2 in long, scales few subequal, lanceolate acuminate outer membranous, inner fleshy *Stem* 12–18 in stout *Leaves* 1½ 3 by ¾ in *Flowers* purple *Segments* 1½–2 in long *Style* shorter than the ovary, stigma capitate 3 lobed *Capsule* 1 in, broadly oblong —The flowers of *F triceps* are described as white

2 **F. Stracheyi,** *Hook f*, leaves narrowly linear, flowers solitary, perianth segments elliptic ovate acute bearded above the nectary F oxypetala, *Hook Bot Mag* t 4731, *Lemaire Jard Fleur* t 422

TEMPERATE HIMALAYA, Kumaon *Strachey* (*Hort Kew*) West Nepal, alt 12 13 000 ft, *Duthie* S kkim, alt 9–10 000 ft *J D H*

Bulb as in *F oxypetala* but much smaller *Stem* 6–12 in, slender *Leaves* 4–6 by ⅛–⅙ in, radical linear lanceolate long petioled, obtuse *Flowers* pale purple speckled within below the middle, segments 1 in long *Style* as long as the ovary

3 **F. Gardneriana,** *Wall Cat* 5080 leaves narrowly linear, flowers solitary, perianth segments obovate spathulate obtuse naked above the nectary *Baker in Journ Linn Soc* xiv 265

TEMPERATE HIMALAYA Central Nepal *Wallich* Western Nepal, alt 12 13 0 0 ft *Duthie*

Bulbs as in *F Stracheyi* *Stem* slender *Leaves* 2 6 by ⅛–⅙ in *Flowers* more infundibular than in the preceding species with narrower segments, which are obtuse and only ¾ in long *Style* rather longer than the ovary

** *Flowers few or many Perianth broadly campanulate Stigma trifid, lobes spreading truncate*

4 **F. Roylei,** *Hook Ic* ...
lanceolate acuminate straight
nectary broad naked *Baker*
Wall Cat 5079 B, C D (*not*
Guhelmi Waldemarii, *Klot sc*

WESTERN TEMPERATE HIMALAYA, from Kumaon to Kashmir, alt 8–12,000 ft WESTERN TIBET, *Thomson*

Bulb depressed, scales membranous *Stem* 1–2 ft naked below *Leaves* 2–4 by ¼–1¼ in, opposite or 3–6 in a whorl, suberect *Flowers* 1½ 2 in long, campanulate, yellow green, tessellated with dull purple segments ½–¾ in broad *Stamens* half the length of the perianth *Capsule* obovoid, obtusely angled

5 **F. cirrhosa,** *Don Prodr* 51, lower leaves opposite, upper whorled uppermost with cirrhose tips, flowers 1–2 tessellate, nectary broad naked *Kunth Enum* iv 253, *Baker in Journ Linn Soc* xiv 257 F verticillata *Wall Cat* 5079 A (*not of Willd*)

CENTRAL and EASTERN HIMALAYA, Nepal, *Wallich*, Sikkim, alt 11–16,000 ft, *J D H*

Very nearly allied to *F Roylei* and perhaps, as Wallich believed, a variety of that plant the leaves are however larger and narrower and the uppermost have cirrhose tips

6 **F. imperialis,** *Linn Sp Pl* 303, leaves crowded lanceolate lower

opposite upper longer whorled flowers umbelled yellow or brick-red not tessellate, nectary large rounded *Baker in Journ Linn Soc* xiv 274, *Boiss Fl Orient* v 189, *Bot Mag* t 194 and 1215, *Redouté Lil* t 131 F Corona-imperialis, *Gærtn Fruct* i 64 t 17, f 1 Petilium imperiale, *J St Hil Fam Nat* i 120, *Kunth Enum* iv 246

WESTERN HIMALAYA, Kashmir, alt 7-9000 ft, *Thomson, Clarke* —DISTRIB Westward to Kurdistan

Bulb large globose, of broad obtuse gibbous fleshy yellowish scales strong smelling *Stem* 3–4 ft robust naked below *Leaves* crowded 6–10 by 1–2 in, lower obtuse, upper acute often 10 in a whorl *Flowers* 5–8, bracts leafy, whorled, erect linear *Perianth* 2–2½ in long, segments ¾ 1½ in broad *Filaments* flat tened below *Capsule* 2 in long, obovoid, almost 6 winged, umbonate —Crown Imperial

23 LLOYDIA, *Salisb*

Small slender bulbous herbs *Leaves* filiform *Flowers* few or solitary, small white or yellow *Perianth* funnel-shaped suberect, segments 6, persistent straight, 3–5 nerved, with an obscure basal fold or nectary *Stamens* 6, subhypogynous, filaments erect, filiform, anthers basifixed *Ovary* triquetrous, style columnar, stigma capitate obscurely 3 lobed, cells many ovuled *Capsule* loculicidal *Seeds* compressed and angled, testa appressed, brown or white —Species 2 or 3, Northern

L. serotina, *Reichb Fl Germ Excurs* 102, *Ic Fl Germ* x t 440, *Kunth Enum* iv 244, *Baker in Journ Linn Soc* xiv 300, *Boiss Fl Orient* v 202 L alpina *Salisb in Trans Hort Soc* i 328 L himalensis *Royle Ill* 388 t 93 f 2, *Kunth l c* 672 L longiscapa *Hook Ic Pl* t 831 Anthericum serotinum *Linn Sp Pl Ed* ii 444 Gagea ? pulchella, *Wall Cat* 5064 Nectarobothrium striatum, *Ledeb Fl Alt* ii 36

ALPINE HIMALAYA and TIBET from Kashmir to Sikkim, alt 12–17 000 ft — DISTRIB Alps of Europe Asia and America

Bulb elongate, ¼ 1 in base rhizomatous neck very long coats membranous *Leaves* 2–8 in wiry convolute *Stem* 4–12 in, with 1–2 small leaves rarely forked *Flowers* suberect white with violet veins or yellow purple at the base, segments ⅓–⅔ in, oblanceolate or spathulate broad or narrow nectary very small, green *Stamens* ⅓–½ shorter than the perianth, filaments glabrous pubescent or villous, anthers minute, very variable in shape *Style* as long as the ovary *Capsule* ¼–⅓ in, obovoid or obcordate *Seeds* triquetrous foveolate —I am unable to find any character whereby to distinguish the yellow from the white fld states and, what is more remarkable the specimens with hairy filaments (*L. longiscapa* Hook, *Gagea ? pulchella*, Wall) pass into these with glabrous filaments and grow inter mixed with them A very minute tufted state, under an inch long, occurs at 13 14 000 ft elevation in Sikkim with sepals only ⅙–¼ in long In a drawing which I made of the ordinary Sikkim form, the nectary is represented as a drop of fluid on the naked surface above the base of the sepal

24 TULIPA, *Linn*

Bulb coated *Leaves* few, linear or oblong *Scape* naked above, or 1–2 leaved, 1–3 fld *Flowers* large, usually erect *Perianth* campanulate, segments 6, quite free, nectary 0 *Stamens* 6, hypogynous, anthers basifixed erect *Ovary* oblong, stigmas 3, subsessile, recurved, cells 3, many-ovuled *Capsule* loculicidal *Seeds* flattened, testa membranous pale, appressed —Species about 50, temp Europe N Africa and N Asia

1 T. chrysantha, ...

78, Fl
undulat
with re
mucron
in Bung
Ic Pl Asiat t 278, f. 1

The PANJAB, *Jacquemont*, Salt Range, *Fleming* —DISTRIB Affghanistan, Central Asia and N Persia

Bulb ¾–1 in diam *Stem* 3–4 in *Leaves* 4–5 glabrous glaucous, lower 4 6 in recurved, lanceolate channelled upper narrower *Perianth* 1–1½ in long, claws of the segments brown *Anthers* longer than the glabrous filaments *Ovary* with a narrow neck, stigmas small —Bulbs eaten in Beluchistan

2 **T. stellata,** *Hook Bot Mag* t 2762 bulb scales woolly within leaves narrowly linear channelled not undulate perianth white within, base yellow, rosy or greenish without, segments all alike obtuse or sub acute *Kunth Enum* iv 223, *Baker in Journ Linn Soc* xiv 281 (*excl syn Kotschy, No* 9?) T Clusiana *var* stellata *Regel Enum Tulip* 54 Anthericum uniflorum *Roxb Fl Ind* ii 149

TEMPERATE WESTERN HIMALAYA alt 5–8000 ft from Kumaon westwards

Bulb ¾ 1 in diam *Stem* 12 18 in slender naked below *Leaves* 4 6 9–12 in, ...

25 **GAGEA,** *Salisb*

Small bulbiferous herbs with a solitary leaf from the base of the bulb, and a short naked stem bearing more or less umbelliform leafy cymes or corymbs of flowers *Perianth* stellate usually yellow, nectary 0 *Anthers* erect, basifixed *Capsule* membranous loculicidal *Seeds* many, flat or angled, testa membranous —Species about 20 north temp regions

1 **G. lutea,** *Schult f Syst* ...
cauline 2 subopposite, flowers 3–6 ...
very small seeds subterete curve...
Orient v 207, *Reichb Ic Fl Germ* x t 4.., *Bot Mag* t 1..0 G Moorcroftiana, and elegans, *Wall Cat* 5063 5065

WESTERN HIMALAYA, from Kumaon westwards alt 6–13 000 ft —DISTRIB Westward to the Atlantic N Asia

Bulb solitary in the coats about as large as a hazel nut. *Radical leaf* 3–8 by ⅛–¼ in cauline subsimilar *Stem* 2 5 in, glabrous or laxly villous *Flowers* yellow perianth segments linear-oblong obtuse or acute, filaments about half as long anthers oblong *Capsule* not half as long as the perianth, broader than long

2 G. persica, ...

winged G amblyopetala,
2, t 17 (non Boiss) G
Bulbillaria gageoides, Zucc
1 Lloydia kunawarensis,

WESTERN HIMALAYA, from Kunawur to Kashmir, alt 5-8000 ft, *Royle, &c* —DISTRIB Westwards to Persia, Turkestan

Bulb solitary in the coats *Radical leaf* 4-6 by $\frac{1}{4}$-$\frac{1}{2}$ in *Stem* 4-6 in, glabrous, very slender *Cymes* 1 2 in, often with bulbils in the axils of the short very slender pedicels *Sepals* linear, obtuse, filaments nearly as long, anthers sub didymous *Capsule* nearly as long as the perianth *Seeds* compressed, not angled or winged

3 **G. reticulata,** *Schultes f Syst* vii 542 leaves all very long filiform recurved cauline numerous subverticillate, flowers many sub
te, capsule as long
v 208 *Reichb Fl*
1-4, *Expl Alger*
ss) G commutata,
7-230 G pedunculata

The PANJAB PLAINS, ascending the Western Himalaya, Salt Range, &c, to 5500 ft —DISTRIB Westwards to Greece and N Africa Turkestan

Bulb densely fibrilliferous *Stem* 2-3 in, stout or slender *Leaves* 4-8 in, cauline usually very many, and long, rarely few and short *Flowers* numerous, very variable in size, green with a white border *Anthers* linear-oblong

26. COLCHICUM, *Linn*

Corm coated *Leaves* radical, linear or lanceolate *Scape* very short, sessile amongst the leaf sheaths, 1-3 fld *Flowers* large, erect *Perianth* funnel shaped, tube very long and slender, lobes 6 subequal, suberect *Stamens* 6, inserted in the bases of the segments included, anthers dorsifixed, versatile, introrse *Ovary* sessile, 3 celled, styles 3, long, filiform, cells many ovuled *Capsule* chartaceous septicidal *Seeds* subglobose, testa appressed brown —Species about 30, Europe, N Africa and temp Asia

C. luteum, *Baker in Gard Chron* (1874) 33, *Journ Linn Soc* xvii 434, leaves appearing with the flowers linear oblong or oblanceolate obtuse, perianth golden yellow, tube 3-4 in, segments oblong or oblanceolate obtuse many nerved *Bot Mag* t 6153 Melanthaceæ, *Griff Notul* iii 241, *Ic Pl Asiat* t 278, f 2

WESTERN TEMPERATE HIMALAYA, Kashmir, alt 4-7000 ft, *Thomson, &c*, Chamba, *Ellis, &c* —DISTRIB Affghanistan, Turkestan

Corm gibbously ovoid, coats dark brown *Leaves* few, lorate, short at the flowering time, at fruiting 6-12 by $\frac{1}{2}$-$\frac{3}{4}$ in tip rounded *Flowers* 1-2 (in spring), 1-1$\frac{1}{2}$ in diam when expanded *Stamens* shorter than the perianth, filaments very much shorter than the long yellow anthers *Style* filiform much longer than the perianth *Capsule* 1-1$\frac{1}{2}$ in, valves with long recurved beaks

27. MERENDERA, *Ramond.*

Habit and characters of *Colchicum*, but with the perianth segments free to their base, their long slender claws forming a tube, and the anthers

either basifixed or dorsifixed —Species about 10, S Europe, N Africa and Oriental

M. persica, *Boiss & Kotsch Diagn* xiii 37, *Fl Orient* v 169, leaves appearing with the flowers linear acute, scape 1–4 fld perianth pale lilac, segments lanceolate subacute, blade ⅓ shorter than the slender claw, anthers basifixed *Baker in Journ Linn Soc* xvii 440 M Aitchisoni, *Hook f in Bot Mag* t 6012, *Boiss l c* 169

The PANJAB on the Salt Range, and near the Jhelum *Vicary Aitchison* — [illegible] Persia

[illegible] t red-brown *Leaves* 1–2 in in [illegible] *Flowers* 1½ 2 in diam, seg [illegible] ubulate equalling the anthers — Boissier keeps *Aitchisoni* distinct from *persica* on account of the paler corms, and shorter green anthers Baker unites them

28 IPHIGENIA, *Kunth*

Corm coated *Stem* erect leafy *Leaves* few, scattered, linear, upper bractiform *Flowers* small erect solitary or corymbose *Perianth* 6 partite, stellate, deciduous, segments equal narrow, clawed spreading *Stamens* 6, hypogynous filaments short flat, anthers oblong, introrsely attached, versatile *Ovary* sessile, 3 celled styles minute, united at the base, linear recurved, introrsely stigmatose, cells many ovuled *Capsule* loculicidal *Seeds* subglobose testa thin brown, appressed — Species 4 Indian African and Australasian

1 I. indica, *Kunth Enum* iv 213, perianth purplish segments linear subulate *Baker in Journ Linn Soc* xvii 450, *Benth Fl Austral* [illegible] ullaria indica *Br* [illegible] A Heyneana, [illegible] M racemosum [illegible], *Steud Pl Ind*

Throughout INDIA from the N W frontier to BURMA, ascending the KHASIA HILLS to 4–5000 ft and the HIMALAYA to 7000 ft CEYLON, Trincomalee *Glenie* [illegible]

[illegible] *Stem* 3 10 in, flexuous [illegible] many, reddish or pur [illegible] ¼ in long, segments [illegible] oblong most variable in [illegible] high, very robust and broadish leaved

2 I. pallida, *Baker in Journ Linn Soc* xvii 151 perianth white, segments oblanceolate acute many nerved ? A indica, *Grah Cat Bomb Pl* 222

The CONCAN, *Ritchie* &c on the Ghats at Mahableshwar, and Belgaum Probably a var of *indica* with smaller narrower leaves and bracts, white flowers with much broader segments and shorter pedicels

29 TOFIELDIA, *Huds*

Rootstock creeping *Leaves* radical, equitant, ensiform *Scape* slender, flowers small green or white, spicate or racemed, bracts minute *Perianth*

persistent, segments 6, spreading. *Stamens* 6, on the base of the segments, filaments filiform, anthers short, dorsifixed, versatile, introrse *Carpels* 3, many-ovuled, styles short, persistent, stigmas obtuse *Follicles* 3, membranous, acute *Seeds* many, minute, cymbiform or slender, testa thin, pale —Species about 14, Arctic and Alpine

T. himalaica, *Baker in Journ Linn Soc* xvii 489, leaves narrowly linear 3–5 nerved margins scabrid, fruiting pedicels ascending bracteate at the base calyculate at the apex

SIKKIM HIMALAYA, alt 10–12 000 ft, *J D H*, *Clarke*

Stem 8–18 in, glabrous *Leaves* 2–4 by 1/12–1/8 in *Fruiting* raceme 4–8 in, lower pedicels 1/6–1/4 in *Perianth* 1/6 in long, greenish white, segments narrowly oblanceolate, 1 nerved *Capsule* 1/6–1/4 in, obovoid, styles very slender, 1/3 the length of the cells *Seeds* slender, terete, acute at both ends

30 GLORIOSA, *Linn*

Rootstock tuberous, naked *Stem* climbing, leafy *Leaves* scattered, opposite or 3 nately whorled, lanceolate, costate, tip elongate spiral *Flowers* large, axillary, solitary, pedicels reflexed *Perianth* persistent,

[illegible]

ceous, septicidal *Seeds* subglobose, testa spongy, embryo cylindric — Species 3, tropical Asiatic and African

G. superba, *Linn Sp* [illegible]
Baker in Journ Linn Soc x[illegible]
Bomb Pl 221, *Wight Ic* t[illegible]
Reichb Ic Exot t 51 G su[illegible]
Syst vii 366 Methonica s[illegible]
iv 276, *Redoute Lil* t 26, [illegible]
Kunth l c Eugona superba, *Salisb Prodr* 238 —*Rheede Hort Mal* vii t 57

Throughout TROPICAL INDIA, from the N W HIMALAYA to ASSAM, BURMA, MALACCA and CEYLON ascending to 5000 ft —DISTRIB Trop Africa, Malacca, Cochin China

Rootstock a chain of fleshy arched tubers, budding from the convexity above *Stem* 10–20 ft, terete, herbaceous *Leaves* 6 8 in sessile or shortly petioled, variable in breadth, many nerved *Flowers* solitary or subcorymbose towards the [illegible]

31 TRICYRTIS, *Wall*

Rootstock creeping *Stem* dichotomously branched above, leafy *Leaves* alternate, subsessile or amplexicaul, strongly nerved *Flowers* subcorymbose or racemose, white spotted with purple *Perianth* campanulate, deciduous, segments 6, lanceolate, 3 outer saccate or 2 gibbous at the base, inner gibbous or flat *Stamens* 6, subhypogynous, filaments cohering or conniving in a tube below, spreading above, anthers dorsi-

fixed, extrorse *Ovary* 3 celled, style 3 fid, arms 2 fid, cells many ovuled *Capsule* coriaceous, linear, triquetrous, septicidal *Seeds* 1 seriate, minute, flat, testa lax, brown, reticulate —Species 5, Himalayan, Chinese and Japanese

T. pil ...
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t 4955,
Compson
Syst Veg Cur Post 137

TEMPERATE HIMALAYA, Nepal *Wallich*, Sikkim alt 5–8000 ft *J D H*, &c Bhotan, *Griff* The KHASIA HILLS, alt 5 6000 ft

Stem 2–4 ft, slender *Leaves* 4–6 by 1½ 3 in, acuminate, subpinnately 6–9-nerved *Flowers* 1½ in diam pedicels stout strict, bracts small lower ovate cordate, upper linear or 0 *Perianth segments* lanceolate, recurved from just above the bigibbous nectariferous base subacute sparsely glandular without, yellowish white with purple spots *Filaments* stout, terete erect, then stellately spreading, anthers lilac *Style* short clavate, arms recurved stout, obtuse *Capsule* 1–1½ in

32 DISPORUM, *Salisb*

... *Leaves* sessile or sub ... ullary few fld umbels, ... ous, segments 6, erect, ... anthers dorsifixed, ... as 3 short, cells 2–6 ... obose testa appressed,

... *ispora* ... reatly ... leaves ... l even ... white,

genus

1 **D. calcaratum,** *Don in Trans Linn Soc* xviii 516, perianth ... *Enum* iv 207, *Baker in* ... Hamiltonianum, *Don* ... *Journ Linn Soc* xxviii ... Hamiltoniana, *Wall Cat* 5088 in part. U Betua, *Ham mss*

TEMPERATE HIMALAYA, from Nepal, *Wallich*, eastwards, alt 5–8000 ft KHASIA MTS, MUNNIPORE and BURMA, alt. 3–5000 ft

Stem 1–2 ft. *Leaves* 2–3 in, oblong lanceolate, acuminate *Flowers* ½–⅔ in long, usually narrow, white greenish or purplish, spurs very variable, in short flowered specimens ⅛ in long, equalling the blade of the sepal in length *Style* slender, rarely exserted

Don gives the following characters to the species united above —*calcaratum*, sepals lanceolate acuminate long-spurred, filaments thrice as long as the anthers *Wallichii*, sepals lanceolate acuminate spur short straight, filaments five times as long as the anthers *Hamiltonianum*, sepals lanceolate acute, spur short recurved anthers as long as the filaments An original drawing of the latter (Hamilton's 'Betua,' spelled *Betiya*) has acuminate narrow purple sepals with very short spurs, it is not distinguishable from a drawing by Horsfield of the Javanese *multiflorum* (*Horsfieldii*) The Burmese *D latipetalum* has broader sepals and in this respect approaches the Chinese *D uniflorum*, berry intermediate

2 **D. pullum,** *Salisb in Trans Hort Soc* i 330, perianth segments spathulate or lanceolate acute or [illegible] *Don Prodr* 50 *in Trans Linn So*[illegible] *Baker in Journ Linn Soc* xiv 589 *Kunth l c* 20[illegible] [illegible] florum, *Don* [illegible] *nn Soc l c* 518, *Kunth l c* 2[illegible] [illegible] lorum, *Don ll cc* 50 and 520, [illegible] *Linn Soc Not* 1839 Uvula[illegible] U parviflora and umbellata, *W*[illegible] *As Par* iii 43, t 269, *Cat* 5090 U multiflora *Reinw in Blume Cat Hort Buitenz* 62 U parviflora, *Wall in As Res* xiii 378, *Cat* 5091 *in part* U Hamiltoniana, *Wall Cat* 5088 C *in part*, D Streptopus chinensis and peduncularis, *Smith in Rees Cyclop under* Uvularia Drapiezia multiflora, *Blume Enum* i 8

TEMPERATE HIMALAYA, from Garwhal eastwards, alt 4 8000 ft KHASIA and MUNNIPORE HILLS BEHAR, on Parusnath —DISTRIB Sumatra Java, China

Stem 2–4 ft, sometimes robust, or branched *Leaves* 2–6 in, ovate-oblong or lanceolate, acute or acuminate *Flowers* white or dull purple in sessile or peduncled many- or few-fld umbels, pedicels ½–1 in

The type of this species is the Chinese *uvularia chinensis* of the Botanical Magazine, a purple flowered plant hardly distinguishable from shortly spurred specimens of *calcaratum* The flowers are narrow, nearly an inch long with lanceolate acute [illegible]

[illegible] about twice as long as the anthers

3 **D. Leschenaultianum,** *Don in Trans Linn Soc* xviii 518, [illegible] acuminate base saccate *Kunth* [illegible] v 590, *Thwaites Enum* 338, [illegible] ceylanicum and mysorense *Wall Cat* 5089

The WESTERN GHATS; from Canara southwards CEYLON, alt 4–7000 ft

Stem 1 2 ft, branched above *Leaves* mostly shortly petioled 2–4 in, and broadly ovate or oblong ovate acuminate, but very variable in breadth *Flowers* quite white, in 3–5-fld umbels *Perianth* ½ in long, segments obtuse, obscurely

ciliate *Filaments* about as long as the anthers or longer —Wight figures the perianth segments of his three species as acute or acuminate His *ceylanicum* is *mysorense* His Bot Mag plate of the large flowers *chenaultianum* is

33 CLINTONIA, *Rafin*

Rootstock creeping *Leaves* subradical, narrow, costate *Scape* naked or 1 leaved *Flowers* in terminal umbels or racemes, rarely solitary, bracts linear or 0 *Perianth* funnel shaped, deciduous segments 6, subequal *Stamens* 6, inserted on th dorsifixed, subextrorse cells 2- or more ovuled more, ovoid or obtusely c hard, embryo minute —

C. alpina, *Kunth Enum* v 159, leaves obovate to oblanceolate cuspidate or acuminate, scape leafless and pedicels pubescent perianth-segments oblanceolate 5-7-nerved *Baker in Journ Linn Soc* xiv 585 Smilacina alpina, *Royle Ill* 380

TEMPERATE HIMALAYA, alt 8 11 000 ft from Garwhal to Sikkim, alt 12 000 ft, and Bhotan

Leaves few, 4 9 by 2-4 in subcrect, glabrous nerves many, slender *Scape* 6-24 in, slender, flowers loosely racemose or the upper umbellate, pedicels ¼-1 in, straight, fruiting elongate curved, bracts caducous *Perianth* ¼-⅓ in long, white *Stamens* included, anthers small *Ovary* ovoid style short, 3 toothed *Berry* ¼-⅓ in diam, many-seeded fruiting pedicels ¾ 1½ in, distant, upcurved —The Chinese *C udensis*, F & M, hardly differs

34 TRILLIUM, *Linn*

stigmatose within, cells many ovuled *Berry* fleshy *Seeds* ovoid, with a lateral pulpy strophiole, albumen fleshy, embryo minute —Species 12, a few Himalayan, Chinese and Japanese, the rest N American

1 **T. Govanianum,** *Wall Cat* 812, leaves shortly petioled ovate or ovate cordate acute, sepals subequal narrowly linear *Royle Ill* 384, t 93 Trillidium Govanianum *Kunth Enum* v 120

TEMPERATE HIMALAYA, from Kashmir, alt 8-10,000 ft, to Sikkim, alt 9 11 000 ft

2 **T. Tschonoskii,** *Maxim in Bull Acad. Petersb* xxix (1884) 218, leaves sessile broadly subrhomboidally ovate or orbicular cuspidately acuminate, sepals green oblong lanceolate, petals similar dull purple.

SIKKIM HIMALAYA, alt 10-11,000 ft, *J D H*, *Clarke*. BHOTAN and the Mishmi Hills, *Griffith* —DISTRIB Japan

Stem 8–12 in *Leaves* 2–3 in broad and long or narrower *Peduncle* ½–¾ in *Flowers* ¾–1 in diam; filaments flat, rather longer than the linear anther *Style* very short —This, which differs from the American and Japanese *T. erectum* chiefly in the longer filaments, will (with others) prove, I expect, a form of that variable species

35 PARIS, *Linn*

Characters of *Trillium*, but leaves 4–9 in a whorl, and flowers 8–12 merous Species 5 or 6, Europe, Temp Asia

1 **P. polyphylla,** *Smith in Rees Cyclop*, leaves 4–9 petioled oblong or oblanceolate acuminate, sepals 4–6 ovate lanceolate acuminate, petals as long or longer filiform fruit 3 6 valved testa pulpy *Don Prodr* 49, *Kunth Enum* v 118, *Wall Pl As Rar* ii 24 t 126, *Cat* 3710, *Hook f Ic Cathcart*, t 24 P Daisua, *Herb Ham*. P imperialis, *Jacquem mss* Euthyra, *Salisb Gen Pl Fragm* 61

TEMPERATE HIMALAYA, from Simla to Bhotan, alt 6 10,000 ft —DISTRIB W China

Rootstock annulate, sometimes as large as a small potato *Stem* 3 in to 3 ft. *Leaves* 3 6 in dark green, base rounded or acute; petiole ¼ in or less *Sepals* 1–4 in, green 3 nerved *Petals* sometimes twice as long, yellow *Anthers* longer than the filament, very narrow connective very shortly produced or not *Ovary* subglobose septa nearly reaching the axis *Fruit* green, smooth, 2½ in diam, or less, coriaceous loculicidal *Seeds* ¼ in long, or less, ovoid, scarlet.—Extremely variable in the number and size of all parts

ORDER CLVII PONTEDERIACEÆ.

Fresh water and marsh herbs *Leaves* erect or floating, nerves parallel. *Flowers*, bisexual, in spikes or racemes from the sheath of the uppermost leaf bracts sheathing irregular *Perianth* unequally 6-partite, white or blue marcescent *Stamens* 1–6, inserted at the base of the lobes, anthers erect or versatile, one usually longer than the others *Ovary* free, 3 celled, or 1-celled with 3 parietal placentas placentas one or more-ovuled, style slender stigma subentire or lobed, ovules anatropous *Capsule* membranous loculicidally 3 valved *Seeds* small, albumen horny or floury, embryo cylindric —Genera 5, species about 30

MONOCHORIA, *Presl*

Rootstock short or creeping *Leaves* radical and solitary at the top of the emerged stem or branches *Perianth* campanulate, 6 partite *Stamens* 6, one usually largest, with the filament toothed on one side, anthers basifixed, slit terminal at length elongating *Ovary* 3 celled, many-ovuled —Species about 6, in the tropics of the old world.

1 **M. hastæfolia,** *Presl Rel Hænk* ii 128, rootstock creeping, leaves

P saggitata *Roxb Fl Ind* ii 121, *Wall Cat* 5093 P dilatata, *Andrews Bot Rep* vii t 490, *Buch Ham in Syme's Embass* 475 *with plate*, *Roxb l c* 123, *Wall Cat* 1094 P sagittifolia, *Herb Heyne*

Common throughout INDIA and CEYLON —DISTRIB. Malay Islands, China

Rootstock spongy, flowering stems short *Leaves* 6 7 by 5–6 in, obtuse or

2 **M. vaginalis,** *Presl Reliq Hænk* ii 128, rootstock short, leaves long petioled, from linear to ovate and ovate cordate, flowers short-pedicelled

Phanero

Linn M

5095, *L*

Throughout INDIA, from Kashmir eastwards to Assam and southwards to Travancore and Singapore CEYLON common —DISTRIB Malay Islands, China, Japan, Trop Africa

Rootstock suberect (creeping *Roxburgh*) *Leaves* much as in *M hastæfolia*, but few nerved *Inflorescence* centripetal few- or many fld, flowers blue, sprinkled with red, very variable in size pedicels shorter than the perianth *Filaments* and *anthers* as in M *hastæfolia* —A most variable plant

Var *plantaginea*, Solms Laub l c, smaller, leaves often narrow, raceme few-fld M pauciflora *Kunth* § *Miquel ll cc* M linearis *Miq l c* Pontederia plantaginea *Roxb l c* 123, *Wall Cat* 5096 P pauciflora, *Blume Enum Fl Jav* i 32 P racemosa, *Herb Ham* —India, Java

ORDER CLVIII PHILYDRACEÆ.

Erect herbs *Leaves* narrowly linear *Flowers* small, in bracteate spikes or panicles, bisexual, irregular *Perianth* inferior, 2 partite, segments antero-posterior, petaloid, persistent *Stamen* 1, inserted on the base of the anterior segment, filament flattened, anther straight or

species 4, Asiatic, Australian and Pacific

PHILYDRUM, *Banks*

Spike simple *Anthers* at length twisted *Ovary* 1 celled.

..., *Kunth* viii. 312, ..., *Benth* ..., *Schlecht* & ... 231, *Ic.* ... iii t 15

BURMA, the ANDAMAN ISLANDS and the MALAY PENINSULA.—DISTRIB China, Malay Islands, Australia

and tuberculate, chalaza black, funicle short pale

ORDER CLIX XYRIDEÆ.

Tufted rigid herbs *Leaves* radical, linear or subulate *Scape* simple, naked *Flowers* sessile in the rigid dark brown imbricating bracts of a terminal head or spike, bisexual *Bracteoles* (sepals?) 3, deciduous, scarious, embracing the claws of the petals 2 lateral 1 broader dorsal often hooded *Petals* 3, clawed claw erect spreading, limb golden yellow, marcescent *Stamens* 3, inserted at the bases of the petals, included, anthers sagittate, staminodes 3, alternating with the inner segments, filiform, bearded or antheriferous, sometimes 0 *Ovary* free, imperfectly 3 celled, placentas 3, many ovuled, basal and confluent or parietal, style trifid stigmas capitate or dilated, ovules anatropous *Capsule* loculicidally 3-valved or with the top circumsciss *Seeds* numerous, linear, albumen flowery, embryo minute —Genera 2, species about 50, one (*Xyris*) found in all warm regions, the other American

XYRIS, *Linn*

Characters of the Order

* *Leaves distinctly flat*

1 **X. indica,** *Linn Sp Pl* 62, robust, leaves loriform $\frac{1}{4}$-$\frac{1}{3}$ in broad, scape stout deeply grooved, spike ovoid or globose, bracts orbicular or cuneately obovate *Vahl Enum* ii 204, *Roxb Fl Ind* i 179, *Mart in Wall Pl As Rar* iii 30, *Kunth Enum* iv 20, *Wall Cat* 6086 B, C, *Dalz & Gibs Bomb Fl* 259, *Miq Fl Ind Bat* iii 528, *Steud Syn Pl Cyp* 288 —*Rheede Hort Mal* ix t 7

BENGAL, in low marshes at the foot of the SIKKIM, ASSAM and KHASIA HILLS southward to MALACCA and from the South Concan (in salt marshes) to CEYLON — DISTRIB Malay Islands

Leaves 1 2 ft, spongy, obtuse *Scape* as long, acutely angled *Spike* $\frac{1}{3}$-$\frac{3}{4}$ in, bracts $\frac{1}{4}$ in broad, few or many, dark red brown, shining, broader than long, margins scarious, bracteoles linear spathulate, smooth *Petals* orbicular, erose

2 **X. robusta,** *Mart in Wall Pl As Rar* ii 30, leaves scape and spike of *X indica* but bracts broadly ovate oblong longer than broad *Wall Cat* 6087 *Kunth Enum* iv 19; *Steud Syn Pl Cyp* 287

SILHET; *Wallich*

Apparently distinct from *X indica* in the form of the bracts, probably also in other characters that are not available in the few dried specimens at my disposal

3 **X. anceps,** *Lamk Ill* i 132, leaves narrowly linear $\frac{1}{10}$-$\frac{1}{6}$ in broad rigid twisted much shorter than the flattened or 2-edged grooved

7. X malaccensis, *Steud l c* 287 —Xyris No 2, *Griff Notul* iii 123

Sandy places, often near the sea BURMA *Griffith* SINGAPORE and MALACCA, *Maingay* SOUTH DECCAN PENINSULA and CEYLON, *Wight* &c —DISTRIB Borneo, &c

Densely tufted *Leaves* 6–12 by 1/10–1/6 in very rigid, pungent strongly grooved on both faces, pale green *Scape* 1 2½ ft slender rigid *Spike* ¼–⅓ in, rarely globose, lateral bracteoles ovate-lanceolate acuminate, tip lacerate, keel spinulose *Petals* toothed

4 **X. Wallichii,** *Kunth Enum* iv 16 dwarf, leaves gladiate 3–6 by ... nder compressed scape, ... *Steud Syn Pl Cyp* ... *Asiat* t 161 C —*Wall*

KHASIA HILLS alt 4–6000 ft *Wallich* &c BURMA at Moulmein, *Lobb*

A slender flaccid loosely tufted species *Leaves* few often falcate, bright pale green, faintly striate *Scape* usually filiform, rarely stout *Spike* ¼–⅓ in bracts rich brown with pale midrib and margins, bracteoles subequal, red-brown, with green midrib and pale margins lateral spathulately oblanceolate, obtuse, quite glabrous *Petals* oblong, subcrenate *Style* very long

** *Leaves usually less than* ⅙ *in broad, not distinctly flattened* (*except in forms of* X pauciflora)

5 **X. schœnoides,** *Mart in Wall Pl As Rar* iii 30, leaves narrowly linear acuminate much shorter than the very slender striate compressed scape, spike globose or ovoid, bracts broadly oblong obtuse outer nearly as long as the inner *Wall Cat* 6084 and 6083 *in part*, *Kunth Enum* iv 16, *Miq Fl Ind Bat* iii 529, *Steud Syn Pl Cyp* 287 X nilagarensis, *Steud Plant Exsicc Nilg Hohenack* No 956

NEPAL *Wallich* KHASIA and NILGHIRI HILLS alt 4–6000 ft, common CEYLON, ascending to 6000 ft, —DISTRIB China

Leaves 2–10 in, slender 1/15 ⅙ in broad, tapering from the base to the tip *Scape* 1 2 ft, stout *Spike* ¼–⅓ in diam, bracts almost rounded, back brown, keeled towards the rounded tip, lateral bracteoles oblanceolate, acuminate, dorsal ovate-lanceolate

... *Sp Pl* i 255, leaves equalling or shorter ... scape, spike ovoid or a green tip *Vahl* ... *Wall Pl As Rar* iii 29, *Cat* ... *iq Fl Ind Bat* iii 529, *Steud* ... *in Herb Hohenack* n 369, *Steud l c* 286

Foot of the HIMALAYA, in marshes from Nepal eastwards to BENGAL and BURMA, and southwards to MALACCA and CEYLON —DISTRIB Malaya, China and Australia

7 **X. bancana,** *Miq Fl Ind Bat Suppl* 608, dwarf, leaves 1-2 in. filiform smooth flexuous rigid much shorter than the filiform flexuous smooth compressed scape, spike very small ovoid, bracts few obovate obtuse

MALACCA, in sandy places near the sea, *Griffith, Maingay*, Pahang, *Ridley* — DISTRIB Banca

Resembles a small form of X *pauciflora*, but much more slender and rigid, with filiform scape *Leaves* 1/16 in broad, grooved *Spike* 1/4 in, bracts pale, inner hardly exceeding the outer *Lateral bracteoles* linear lanceolate, strongly ciliate, keel toothed

DOUBTFUL SPECIES.

8 X LAPPACEA, *Herb Heyne ex Mart in Wall Pl As Rar* iii 30, *Wall Cat* 6085, *Kunth Enum* iv 16, *Steud Syn Pl Cyp* 287 —There is no specimen in W llich s Herbarium, only the empty sheet, with his number and a ticket of Heyne's inscribed "Xyris capensis, Restiac 28," across which Wallich has written "Return" —The inference is that the specimen was lent to Martius with the others of the genus and possibly never returned The reference to *capensis* makes me suspect that it is X *anceps*, which strongly resembles and may be the same as a Cape species

ORDER CLX **COMMELINACEÆ.**

Herbs, rarely climbing or undershrubs *Leaves* costate, bases sheathing, nerves parallel *Inflorescence* various *Flowers* usually bisexual, more or less irregular *Perianth* inferior, 6 partite, 3 outer segments herbaceous often persistent, 3 inner spreading *Stamens* 6, 1 ovules 1 or few in the inner angle loculicidal or indehiscent *Seeds* angled, testa smooth or rugose, albumen floury, embryo minute, far from the hilum —Genera 25, species about 300, tropical and subtropical

The specific characters, synonyms, &c, are drawn up with permission, from C B Clarke's careful and exhaustive "Monograph of this Order" in Vol III of A de Candolle s Monographs (p 113 and seq), 1881 I have added to the diagnoses a few subsidiary characters that may aid in the recognition of the species

Tribe I POLLIEÆ *Fruit indehiscent, crustaceous*

Panicle terminal, of scorpioid cymes . . . . . 1 POLLIA

Tribe II. COMMELINEÆ *Capsule* loculicidal *Stamens* 3 perfect, with 1-3 staminodes

Cymes solitary, included in a spathe Ovary 3 celled, cells 1 2 ovuled — 2 Commelina
Cymes naked, panicled, rarely in a spathe — 3 Aneilema

Tribe III Tradescantieæ *Capsule* loculicidal *Stamens* 6 perfect

Cymes capitate Petals free — 4 Forrestia
Cymes from imbricating bracts scorpioid or 1-few fld Corolla tubular below — 5 Cyanotis
Cymes scorpioid panicled or spicate Stem twining — 6 Streptolirion
Flowers panicled Stem erect — 7 Floscopa

I POLLIA, *Thumb*

Cymes in a terminal panicle *Sepals* 3 ... *Stamens* 6, or 3 with 3 staminodes, filai ... *Ovary* 3 celled, cells 2-∞ ovuled *Fr* ... *Seeds* smooth —Species about 14, E Asiatic and Australian

1 **P. Aclisia,** *Hassk Commel Ind* 55, tall robust panicle erect lax fld, stamens 6 perfect, fruit subglobose, cells many seeded *Clarke Monogr* 123, *Comm & Cyrt Beng* t 32 P indica β, *Clarke in Journ Linn Soc Bot* xi 451 Aclisia No 2, *Herb Ind Or H f & T*

Tropical Eastern Himalaya, Nepal and Sikkim alt 2 3000 ft, Bhotan *Griffith* Khasia Mts Silhet, Assam Burma —Distrib Java, Tonkin

Stem stout erect *Leaves* 8 12 by 2½ 3½ in narrowed into a broad petiole, ... rulous, margins ... bracts oblong, ... *Seeds* brown,

2 **P. thyrsiflora,** *Endl Gen* 1029, panicle short dense fld, stamens 6 perfect, fruit ellipsoid, cells many seeded *Hassk in Plant Jungh* 150 & *Comm Ind* ... 124 P glaucescens *Teysm* ... Tradescantia thyrsiflora *B* ... *Blume ex Schultes f Syst* ...

South Andaman Islands *Kurz* —Distrib Malay Islands

Stem stout erect, creeping below, sheaths pubescent *Leaves* 10-12 by 2½-3½ in, oblanceolate, narrowed into a 1 2 in petiole glabrous, margins crisped *Peduncle* stout and ovoid panicle pubescent bracts ovate, branches closely scarred, flowers crowded *Fruit* yellow-brown or blue, smooth, dorsally compressed

3 **P. sorzogonensis,** *Endl Gen* 1029, leaves lanceol ...

... *Ind* 40

Eastern Himalaya, Sikkim and Bhotan, and southward to Burma, Malacca and Ceylon —Distrib Malay Islands China New Caledonia

Stem stout erect, viscid *Leaves* 6-10 by 2-3 in, subsessile or shortly-petioled,

glabrous or scaberulous above *Peduncle* villous with deflexed hairs, panicle viscidly pubescent, bracts oblong persistent *Sepals* elliptic, glabrous or puberulous *Petals* white or pale pink *Fruit* as in *P Aclisia* —The Indian forms occur under two varieties

Var *indica*, leaves subsessile caudate acuminate glabrous or puberulous beneath pedicels viscid sepals persistent, the posterior pendulous P indica, *Thwaites Enum* 323 Aclisia indica *Wight Ic* t 2068, *Hassk Commelin Ind* 41 A elegans, *Hassk Pl Jungh* 49 *Comm Ind* 50 Commelina secundiflora, *Blume Enum* 3 Aneilema secundiflorum, *Kunth Enum* iv 69 —The Deccan Peninsula and Ceylon —Java

and southwards —China

4 **P. subumbellata,** *Clarke in Journ Linn Soc Bot* xi 451,

f & T Dictyospermum Wightii, *var* robustum, *Hassk Commelin Ind* 19

EASTERN HIMALAYA Sikkim, the Bhotan and Mishmi hills, ascending to 6000 ft ASSAM SILHET, CACHAR and MUNNIPORE

Stem creeping and rooting below, then suberect *Leaves* 3–4 by 1–2 in, petioled, elliptic lanceolate, caudate-acuminate, scaberulous on both surfaces *Panicle* puberulous bracts small bracteoles amplexicaul persistent, glabrous. *Sepals* rounded, glabrous enclosing the globose blue fruit which is ¼–⅓ in diam *Petals* white *Seeds* trapezoid dorsally much flattened brown, smooth

5 **P. pentasperma,** *Clarke Monogr* 129, panicle peduncled ovate lanceolate, stamens 3 perfect fruit ovoid narrowed into a long beak acute, cells 1–2 seeded

KHASIA HILLS at Shillong alt 4000 ft, *Clarke* MUNNIPORE, on Kohima, alt 6000 ft, *Clarke*

Stem erect, sheaths long pubescent *Leaves* 3–6 by 1½ 2½ in, shortly petioled caudate-acuminate, elliptic acute at both ends slightly scaberulous above and pubescent beneath *Peduncle* pubescent with deflexed hairs, subumbellate, bracts oblong, bracteoles imbricate, ochreate, persistent *Sepals* puberulous accrescent *Fruit* ½ in long including the beak, which is as long as the body, hard, smooth, brown, shining *Seeds* much compressed, rugulose

2 COMMELINA, *Linn*

Herbs usually slender and creeping below *Flowers* in usually 2-fid

third cell if present 1 ovuled or empty *Capsule* loculicidal, the posticous cell sometimes indehiscent or 0, or the 2 anticous cells empty connate in-

dehiscent and forming a persistent ligulate body, from which the posticous falls away *Seeds* ellipsoid or angled, reticulate pitted or rugose —Species about 90, all tropical and subtropical

C cælestis, Willd, a handsome robust pubescent or tomentose large-fld species, a native of Mexico, is cultivated in gardens, and occurs as an escape at Darjiling and probably elsewhere

Subgen 1 **Didymoon,** *Clarke* Two anticous cells of the ovary 2-ovuled, posticous 1 ovuled or obsolete

Sect. I EUCOMMELINA *Capsule* 3 celled, two anticous cells loculicidal, each usually 2 seeded, the posticous keeled deciduous, at length dehiscent, 1 seeded, seeds free in the cells *Petals* blue

* *Spathes complicate, margin free or connate at the very base only*

1 **C. nudiflora,** *Linn Sp Pl* 41 (not of others), leaves lanceolate, spathes peduncled ovate lanceolate complicate seeds cylindric reticulate black C communis, *Walt Fl Carol* 68, *Wall Cat* 8978, D, E, C, *Kunth Enum* iv 36 (*Excl Syn*), *Clarke Comm & Cyrt Beng* t i *Monogr* 144 t i f 5 6 C cæspitosa, *Roxb Fl Ind* i 174, *Ed Wall & Carey*, i. 178 C diffusa *Burm Fl Ind* 18, t 7, f 2 C agraria, *Kunth l c* 38, *Hassk Commelin Ind* 26 *Webb & Berthel Phyt Canar* iii 356, t 238, *Seub in Mart Fl Bras* iii i 261, t 36 f 3 C salicifolia, *Bojer Hort Maurit* 360 *Thwaites Enum* 321 (*in part*) C longicaulis, *Jacq Coll* iii 234, t 294 C deficiens, *Flor des Serres*, t 1824 (*not of Hook*)

Throughout the hotter parts of INDIA from the PANJAB to CEYLON and SINGAPORE —DISTRIB tropics and subtropics

Stem creeping and rooting at the nodes or subscandent *Leaves* 1½-3 by ⅓-⅔ in, glabrous scaberulous or puberulous ciliate *Spathes* ⅔ 1 in, acute base rounded or cordate, glabrous or pubescent, striate, peduncle ½-¾ in, cymes 2, branches 1-3-fld *Smaller petals* blue, outer pale or white

2 **C. sikkimensis,** *Clarke Comm & Cyrt Beng* t 6, *Monogr* 147, leaves lanceolate spathes peduncled ovate lanceolate complicate, seeds pyramidal rugose

SIKKIM HIMALAYA, alt 2-4000 ft *J D. H* and KHASIA HILLS, alt. 3-4000 ft, *Griffith*

Stem slender, widely creeping and rooting *Leaves* 2-3 by ¼ ½ in, base unequal usually rounded *Spathes* 1½-2 in, glabrous or nearly so acuminate, base cordate, peduncles ½-1 in, cymes 2 fld upper branch 6-12 fld *Petals* blue *Capsules* 4-8 *Seeds* puberulous, brown black

cordate. *Flowers* small, orange purple or violet *Capsules* 2 on each racei small, 3-5-seeded, dorsal valve at length 2 partite. *Seeds* puberulous, dee transversely grooved

4 **C. salicifolia,** *Roxb Fl Ind* i 172, *Ed Carey & Wall.* i 17 leaves linear-lanceolate, spathes peduncled lanceolate complicate, se globose smooth truncate appendiculate *Clarke Comm & Cyrt. Beng* 2 (*not of Bojer*), *Monogr* 157? *Hassk Commelin Ind* 27. C pedunculo *Link Jahrb* iii 74 (*in part*) C communis, *Wall Cat* 8978 C, D, F, G (*in part, not of Linn*)

From ASSAM and BENGAL, southward and westward to the CONCAN

powdered with white

5 **C. Hasskarlii,** *Clarke Comm & Cyrt Beng* t 5, *Monogr* 1 stem much branched glabrous or pubescent, leaves narrowly lanceol subacute, spathes peduncled cordate glabrous scabrid or hispid complica seeds cylindric conic smooth not appendaged C salicifolia, *var* bre folia, *Herb. Ind Or Hf & T* C communis, *Wall Cat* 8978 F. (*part*)

The UPPER GANGETIC PLAIN, Kumaon and from Delhi eastward to Ass and Bengal, and southward to the DECCAN PENINSULA MALWA, on Mt Ab *Duthie*

Stem much branched, scabrid or glabrate *Leaves* 1-3 by ½-⅔ in, subacute obtuse, sheaths short, glabrous or sparsely ciliate *Spathes* ½-1 in, axilla scattered, base rounded, longer than their peduncle, cymes pubescent, upper brai 2-4, lower 1-2 fld *Seeds* truncate at one end, subacute at the other

** *Spathe funnel shaped or hooded*

6 **C. benghalensis,** *Linn Sp Pl* 41, stem glabrous or pub cent, leaves elliptic ovate obtuse, or tip rounded spathes 1-3 togetl turbinate base auricled on one side, capsule 5-seeded, seeds rugo *Clarke Comm & Cyrt Beng* t 4, *Monogr* 159, *Wall Cat* 8980 A, D, E F, G (*in part*), *Hassk Comm Ind* 28, 29, *Miq Fl Ind Bat* 533 *Wight Ic* t 2065 C nervosa, *Burm Fl Ind* 18 t 7, f 3 cucullata, *Linn Mant* 176 C mollis, *Jacq Collect* iii 235, *Ic Rar* 293 C canescens, *Vahl Enum* ii 173, *Webb & Berth Phyt Canar* 358, t 239 C turbinata, *Vahl l c* 171 C procurrens, *Schlecht Linnæa* xxiv 656, xxv 183, *Regel Gartenfl* iii t 104, iv 44, *Seub Mart Fl Bras* iii i 266 C prostrata, *Regel l c* 1868, 289, t 592, 1 (*not of H, B, K*) C delicatula, *Schlecht in Regel l c* iii 349, t 104

Throughout INDIA, ascending to 6000 ft in the Himalaya.—DISTRIB tr Asia and Africa

Stem creeping and rooting below *Leaves* 1-3 by ½-1½ in, sessile or petiol base suddenly contracted or rounded, sheaths pubescent or villous, often beard or ciliate *Spathes* ¼ ½ in long and broad, pubescent or hirsute, upper brac of cymes 2-3 fld, lower 1 2-fld or suppressed *Flowers* blue *Capsule* me branous, shining, dorsal valve striolate *Seeds* closely pitted

Sect 2 HETEROCARPUS, *Clarke* *Capsule* 3 celled, lateral cells 0-seeded, dehiscent, dorsal not keeled, 1 seeded, indehiscent, deciduou seed free or adnate to the cell. *Petals* yellow, or blue

7 **C. hirsuta,** *Clarke Monogr* 163, dwarf, hirsute or glabrate, leaves
date or lanceolate com-
adnate to the ellipsoid
Pl. Exsicc. p 1316 (in

The DECCAN PENINSULA, Belgaum, *Ritchie*, Nilghiri hills ascending to 6000 ft *Wight*, &c

Stem 6–12 in, erect, branched from the base *Leaves* 2–3 by ¼–½ in, acute or acuminate, more or less hirsute on both surfaces *Spathes* ¾–1 in, hirsute or villous, acuminate, base cordate, peduncle 1–2 in *Flowers* yellow, drying blue *Capsule* with the lateral valves linear, dorsal ellipsoid, subrugose

8 **C. glabra,** *Clarke Monogr* 163, nearly glabrous, leaves small sessile narrowly oblong obtuse, spathes peduncled ovate lanceolate complicate, capsule with the lateral cells linear empty, dorsal globose membranous, seed free globose Heterocarpus glaber, *Wight Ic* t 2067

The SOUTHERN DECCAN PENINSULA, on low hills, *Wight*, &c

Stem rooting at the lower nodes, branched, slender, pubescent on one side *Leaves* 1½–2 by ¼ ½ in, glabrous, margins of the sheaths villous *Spathes* ½–1 in, longer than their peduncle, glabrous pubescent or ciliate, acuminate, base deeply cordate; peduncle scaberulous *Flowers* small, orange yellow

9 **C. Forskalæi,** *Vahl Enum.* ii 172, glabrate, leaves sessile narrowly oblong obtuse, spathes ovate or orbicular shortly peduncled complicate or hooded acute capsule with the lateral cells 0–1 seeded, *dorsal striate, seeds subglobose smooth* *Clarke Monogr* 168, *Hassk in Schweinf Beitr Fl Æthiop* 208 C falcata, *Hassk in Peter's Mossamb Bot* 527

The DECCAN PENINSULA, in the Concan, *Jacquemont*, &c —DISTRIB Afric trop

Stem diffuse rooting at the nodes *Leaves* 1 2 by ¼–½ in, narrowed at the base, margins often undulate *Spathes* ½ in, broader than long, often hispid, base cuneate, or broadly truncate *Petals* blue *Seeds* lead colrd, appendage 0 — Leafless suckers bear deformed capsules that ripen underground

Sect III DISSECOCARPUS, *Clarke* *Capsule* 2 celled, rarely with a dorsal cell which is empty or contains an imperfect seed, lateral cells 1–2-seeded Flowers blue or white

10 **C. clavata,** *Clarke Comm & Cyrt Beng* t 5, *Monogr* 171, t 2,

to 6000 ft. in the

, acuminate, base
narrowed *Spathes* 1–1½ in, glabrous or pubescent, shorter than their peduncles

dorsal cells of the capsule

Var β *Hohenackeri*, Clarke l c., leaves oblong subacute, spathes smaller tip acuminate—Nilghiris (*Hohenack.* No 1066)

11. **C. persicariæfolia,** *Wight in Wall Cat* 8984 (*not of DC*), nearly glabrous, leaves large petioled ovate cordate or lanceolate, spathes broadly ovate cordate peduncled complicate, seeds oblong terete smooth or obscurely rugose *Clarke Monogr* 171 C paludosa, *Burm Thes Zeyl* 69 t 20, f 2, *Moon Cat Pl Ceyl* 5 (*not of Blume*) C benghalensis, *Wall Cat* 8980 H

DECCAN PENINSULA, *Rottler* Dindygul, *Wight* CEYLON, *Regnaud*
Stems diffuse *Leaves* 3–5 by 1–2 in, acuminate, glabrous or puberulous, base

12 **C. attenuata,** *Kœn mss in Vahl Enum* ii 168, glabrous or hirsute, leaves small sessile linear or lanceolate spathes peduncled oblong or ovate-lanceolate deeply cordate, capsule 1 celled, with 2 superposed seeds truncate and appendaged at both ends, or 1 subglobose seed *Clarke Monogr* 172 C rajmahalensis, *Clarke in Journ Linn Soc Bot* xi 444, *Comm & Cyrt Beng* t 7, *Monogr* 172 C repens, *Roxb in Heyne mss* C communis, *Wall Cat* 8978 B (*in part*)

BEHAR CENTRAL INDIA, and the DECCAN PENINSULA in dry places common CEYLON, *Walker*

Stems 12 18 in, tufted, much branched, rather slender *Leaves* 1–2 by ⅙–⅓ in, obtuse or subacute, often complicate and usually recurved *Spathes* ⅝–1½ in, acute or caudate-acuminate, longer than their peduncles, base auricled, deeply cordate *Flowers* small blue *Capsule* oblong-subquadrate, not constricted in the middle either 1-celled with 2 superposed seed, or with one subglobose seed *Seeds* straw colrd, or ashy

Subgen II **Monoon,** *Clarke* All the cells of the ovary 1 ovuled

Sect 4 TRITHYROCARPUS *Capsule* 3 celled, subequally 3 valved *Seeds* free in the cells

13 **C. obliqua,** *Ham in Don Prodr* 45 (*not of Vahl*), stem stout, leaves lanceolate, spathes subsessile solitary or crowded funnel-shaped, capsule trigonous obovoid seeds ellipsoid compressed *Clarke Comm & Cyrt Beng* t 9, 10, 11, *Monogr* 178 t 2, f 3 C polyspatha, *Wight Ic* t 2066 C maculata & C striata, *Edgew in Trans Linn Soc* xx 89, *Wall Cat* 8983 & 8981 (*in part*) C semi ovata *Ham in Wall Cat* 8985 C communis, *Roxb Fl Ind* i 171, *Ed Wall & Carey* i 175 (*not of Linn*) C Donii *Dietr Sp Pl* ii 395 C paludosa, *Blume Enum* i 2 Heterocarpus? obliquus, *Hassk Commelin Ind* 7

Throughout INDIA, from the base of the Himalaya to 6000 ft., the WESTERN GHATS and Singapore CEYLON, not common —DISTRIB Malay Islds
Stem tall, 2–3 ft, branched *Leaves* very variable, 4–7 by 1–2 in, sessile or

viscidly villous form A small state from Darjeeling alt 5–7000 ft (Clarke) has leaves only 1–1½ by ⅓–½ in

14 **C. paleata,** *Hassk. Pl. Jungh* 139, stem stout, leaves elliptic or broadly lanceolate, spathes shortly peduncled scattered broadly ovate

cucullate, seeds broadly ellipsoid smooth *Clarke Monogr* 178 Commelina, sp No 6 *Herb Ind or Hf & T.* Trithyrocarpus paleatus & T oligospathus, *Hassk Commel. Ind* 25

The DECCAN PENINSULA, the Concan and Malabar, *Law, Stocks*, &c —DISTRIB Java.

Stem branched, glabrous *Leaves* 3–6 by 1 2 in, glabrous or scaberulous, acuminate, base rounded or cuneate *Spathes* ½ in, crowded or not, scaberulous or finely pubescent, striate, base broad, rhomboid *Petals* blue ... brown, sometimes margined with white broader and less compressed than ... *obliqua*, of which it is perhaps a var with peduncled spathes

15 **C. undulata,** *Br Prodr* 270, stem stout, leaves ... waved, spathes subsessile ovate hooded acute seeds shortly ... smooth *Clarke Monogr* 179 C ensifolia, F. *Muell Fragm* ... 60, *Benth Fl Austral* vii 83 (*in part*) (*not of Br*) C setosa, *W...* *Wall Cat* 8981 D

... —DISTRIB Aus...

only Indian ... ⅓-½ in The ... elds in which ...

Sect 5 HETEROPYXIS *Capsule* 3 celled, 2 valved, the dorsal ... indehiscent, deciduous, often scabrid *Seed* adnate to the cell

16. C ...

linear or ...
auricled
pressed smooth *Clarke M onogr* 184 C stricta, *Wall Cat* 8981 (*in part, not of others*) C Schimperiana and multicaulis, *Hochst* ... *Schimp Herb* No 1242 and No 2268 Commelina, Sp 3, *Herb Ind Or Hf & T*

SCIND, *Stocks* &c — ...

Stem 1–2 ft thicken...
white, often waved *Sp*...
hispid; raceme usually ...
yellow

17 **C. Kurzii,** *Clarke in Journ Linn Soc Bot* xi 144, *Comm & Cyrt Beng* t 8, *Monogr* 185 t 2, f 4 stem stout, leaves subsessile narrowly lanceolate ...
sessile usually capitat...
seeds in the lateral ...
dorsal hemispheric ...
communis, *and* C s...
part) C angustifoli...
Wall Cat 8982

The SOUTHERN DECCAN PENINSULA, Malabar and the Nilghiris, *Rottler*, &c, CEYLON, common

Stem 1 2 ft, hairy or glabrate *Leaves* 2 6 by ¼–¾ in, acuminate, sheaths ciliate *Spathes* recurved, solitary or clustered, ¾ in long and broad, raceme simple *Petals* blue *Capsule* with the dorsal cell scabrid —Hardly distinguishable from the common American C *virginica* L., except by its country and slightly

by its hairyness A variety (β *glochidea* Kœn mss *Wall Cat* 8981 *B* (*in part*) has elliptic-lanceolate scabrous or nearly glabrous leaves

18 **C. appendiculata,** *Clarke Comm & Cyrt Beng* 13, *Monogr*
[illegible]
Hf & T

NORTHERN BENGAL, *Hamilton*, MYMENSINGH, *Clarke* SIKKIM HIMALAYA, foot of the hills *J D H Clarke* SILHET, *Clarke* CEYLON *Macrae, &c*

Diffusely branched 1 3 ft high *Leaves* 4–6 by $\frac{1}{4}$–$\frac{3}{4}$ in, narrowed at both ends, nearly glabrous *Spathes* 2–3 in glabrous without, hairy within, striate, caudate-acuminate base cordate, raceme 2 fld *Petals* blue or white *Capsule* 2 or 3 celled (the dorsal often 0) *Seeds* somewhat flattened nearly black, appendages conical

Sect 6 SPATHODITHYROS *Capsule* 2 celled (See also *C appendiculata*)

19 **C. suffruticosa,** *Blume Enum* 3, stem stout, leaves large sessile lanceolate scabridly pubescent, spathes small shortly peduncled broadly ovate cordate between cucullate and complicate, seeds ellipsoid rugose *Clarke Comm & Cyrt Beng* 12, *Monogr* 188 t 2, f 5 C semiovata *Wall Cat* 8985 C, E C Simsoni & C rugulosa, *Clarke in Journ Linn Soc Bot* xi 446 Spathodithyros suffruticosus *Hassk Comm Ind* 11

Tropical INDIA from Nepal Sikkim and Bengal to Central India and the Malay Peninsula —DISTRIB Malay Isl ls

Stem branched nearly glabrous *Leaves* 3–14 by $\frac{3}{4}$–2 in, acuminate, sheaths auricled *Spathes* $\frac{1}{3}$–$\frac{1}{2}$ in long and broad longer than their peduncle, panicled or clustered, acute or obtuse villous, raceme simple 6–12 fld *Petals* white or blue *Seeds* straw colrd, puberulous

20 **C. ensifolia,** *Br Prodr* 269, leaves linear lanceolate, spathes very shortly peduncled broadly ovate acute cucullate seeds ellipsoid smooth *Clarke Monogr* 188, *Benth Fl Austral* vii. 83 (*in part*) C striata *Wall Cat* 8981 (*in part*) C lunata *Heyne mss* Commelina sp striatæ affinis, *Edgw in Trans Linn Soc* xx 90

DECCAN PENINSULA, *Pottler*, &c CEYLON, *Walker &c*—DISTRIB Australia

Stem 12 18 in, slender *Leaves* 2–4 by $\frac{1}{6}$–$\frac{1}{3}$ in glabrous, or with deciduous hairs, or villous *Spathes* $\frac{1}{2}$ $\frac{3}{4}$ in glabrous or hairy, base truncate on one margin, hooked at the other, raceme simple

DOUBTFUL AND INDETERMINABLE SPECIES

C AVENÆFOLIA *Grah Cat Bomb Pl* 224, leaves sparsely hairy, sheaths hairy, spathes truncate —Bombay, near Kandalla.

C NIMMONIANA *Grah* l c, small, leaves linear acuminate discoloured — Bombay on Malabar hill and near Rosa and Ellora

C ZEYLANICA *Falkenb in Just Jahresb*, iv 406, 408, name only

C COMMUNIS, Linn and C BENGALENSIS Linn, of Dalzell & Gibson Bomb Flor are undeterminable from the descriptions

3 ANEILEMA, *Br*

Simple or branched, often tuberous rooted herbs *Flowers* in axillary and terminal panicles bracteate and bracteolate, bracts not spathaceous

Sepals 3, free, membranous *Petals* 3 obovate, equal *Stamens* 2 or 3, filaments naked or bearded, anthers oblong one usually smaller or larger

Subgen I **Tricarpellaria**; *Clarke* *Capsule* 3 celled 3 valved.

Sect 1 EUANEILEMA Cells of ovary 2–∞ ovuled *Seeds* 1 seriate in each cell

* Cells of ovary 3–∞ ovuled, of capsule 1 3 or more seeded (see also *A nudiflorum*)

a *Flowers panicled on a radical or subradical rarely leafy scape*

1 **A. glaucum,** *Thwaites mss in Clarke Monogr* 200, leaves large rosulate broadly ensiform scape erect branched from the base, panicle spreading lax fld, bracts small not sheathing capsule triquetrous, seeds 5–8 superposed in each cell

TRAVANCORE, on the Tinnevelly hills *Beddome* CEYLON, *Thwaites* (C P 3977)

Root fibrous *Leaves* 3–6 by 1–1½ in acuminate margin crisped scabrid *Scape* and broad panicle 8–12 in bracteoles small, panicle widely spreading, branches very slender *Stamens* 3 anthers subsimilar, staminodes 2 *Capsule* ½ in, oblanceolate, acute *Seeds* straw colrd, with a white minutely reticulate ep dermis

2 **A. scapiflorum,** *Wight Ic* t 2073, leaves narrowly ensiform, ...ing capsule ellip- ...*ke Comm & Cyrt* ... *Wall Cat* 5207, Commelina scapi flora, *Roxb Fl Ind* i 175 Murdannia tuberosa, *Royle Ill* 403, t 95 Tradescantia aphylla *Heyne mss*

TEMPERATE and TROPICAL HIMALAYA from the upper Gangetic plain eastwards to Bhotan, and westwards to TRAVANCORE and TENASSERIM, CEYLON and the Shan hills

[illegible]

3 **A. Loureirii,** *Hance in Seem Journ Bot* 1868, 250, leaves ensiform scape radical 1–2-leaved panicle narrow, flowers fascicled in the sheathing bracts sepals glandular pubescent capsule elliptic oblong trigonous, seeds 3–5-superposed in each cell *Clarke Monogr* 201 A. spectabile, *Kurz in Journ As Soc Beng* 1871, ii 77, *Clarke Comm & Cyrt Beng* t 20 A spicatum, *Wall Cat* 5217 Commelina tuberosa, *Lour Fl Cochin Ch Willd* i 50

TENASSERIM, *Wallich Helfer* (*Kew Distrib* 5528), &c.—DISTRIB Siam, Malay Islds, China

Root of fascicled elongated tubers *Leaves* all radical, 6–16 by ⅓–1 in, suberect, margins smooth or ciliate only *Scape* stout and *panicle* longer than the

leaves, upper bracts truncate, pedicels viscid *Petals* blue *Stamens* 2 fertile, staminodes 4, all bearded *Capsule* ½ in acuminate *Seeds* yellow brown, pitted

b *Flowering stem leafy, flowers corymbose or panicled*

4 **A. Thomsoni,** *Clarke in Journ Linn Soc Bot* xv 121, *Monogr* [illegible] olate or ensiform caudate [illegible] racts lanceolate caducous, [illegible] beaked cells 5–9 seeded, [illegible] *im & Cyrt Beng* t 31 Dichoespermum giganteum *Hassk Commelin Ind* 42—Aneilema, sp 11, *Herb Ind Or Hf & T*

EASTERN HIMALAYA, Sikkim, alt 5–8000 *J D H*, &c Bhotan, *Griffith* NAGA HILLS alt 7000 ft *Clarke*

Stem 1 2 ft., erect *Leaves* 6–10 by 2 3 in gl brous or scaberulous penni nerved above the base *Panicle* 3–6 in, glabrous, branches spreading widely in fruit bracts caudate *Sepals* glabrous *Petals* purple *Stamens* 3 fertile, uni lateral, staminodes 3 sometimes polleniferous, filaments naked *Capsule* ¾–1 in *Seeds* shortly cylindric black, with white powder

5 **A. divergens,** *Clarke Comm & Cyrt Beng* t 16, *Monogr* 203, stem tall, leaves ensiform shea[illegible] upper branches opposite or subwhorled, bract [illegible] acute at both ends, cells 3–5 seeded [illegible] *urn Linn Soc* xi 448 A longif[illegible] api- florum, *Herb Ind Or Hf & T*

TROPICAL and SUB TROPICAL HIMALAYA, from Chamba alt 6000 ft, *Clarke*, eastwards to Sikkim KHASIA HILLS alt 4–5000 ft UPPER BURMA *Anderson*

Root of elongate tubers *Stem* 2 3 ft leafy *Leaves* 6–12 by ⅓–⅔ in, erect, upper gradually smaller, acuminate *Panicle erect, narrow* bracts ovate, persistent *Petals* blue *Stamens* 3 fertile, staminodes 3, filaments all bearded *Capsule* nearly ½ in, subtrigonous *Seeds* yellow

6 **A. Hookeri,** *Clarke Comm & Cyrt Beng* t 171, *Monogr* 204, stem tall stout, leaves ensiform base broad or subcordate, sheaths bearded panicle erect branches slender spreading repeatedly dichotomous

KHASIA HILLS alt 5 6000 ft, *J D H* and *T T*

Distinguished from *A divergens* by the broader leaf bases and spreading panicle *Stem* 6–12 in, leafy to the top

7. **A. zeylanicum,** *Clarke Monogr* 204, leaves narrowly oblong narrowed at both ends glabrous or pubescent, branches of panicle spreading alternate, branches flexuous, bracts minute, capsule subglobose cells 3–5 seeded, seeds slightly pitted A montanum, & protensum, *Thwaites Enum* 322 A dimorphum, *Thw l c non Dalz*

CEYLON, common up to 3000 ft

Roots fibrous *Stem* 6–12 in, often branched from the base, branches leafy *Leaves* 1–3 by ¾ 1 in sheaths bearded at the mouth *Panicle* glabrous bracts glabrous, hardly sheathing persistent *Stamens* 3 fertile, staminodes 2–3 *Capsule* ¼–⅓ in, obtuse, concave, mucronate *Seeds* brown, with white powder—Var β *longiscapa* Clarke l c, capsule ½ in.—Courtalam, *Wight*

8 **A. lineolatum,** *Kunth Enum* iv 69, stem stout, leaves large narrowly oblong or ensiform acuminate, margins white, panicle glabrous

Hook Journ Bot 1851, ... A latifolium, Wight Ic t 2072 A herbaceum, Wall Cat 5223, Clarke Mon gr 2... , in Journ Linn Soc Bot xi 448 (var a) Commelina herbacea Roxb Fl Ind i 175, Ed Wall & Carey i 179 C lineolata Blume Enum ... C elata, Vahl Enum ii 178 Tinantia lineolata, Hassk Pl Jav ... Prionostachys herbacea, Hassk mss

TROPICAL INDIA, from Sikkim Bhotan and the Khasia hills alt 2 4000 ft., to BURMA Western Ghats from the Concan to Travancore —DISTRIB Malay Islands

Root of slender tubers *Stem* erect stout *Leaves* 4–12 by 1–1½ in, margins scabrous or smooth often crisped base cuneate rounded or cordate upper ovate-lanceolate *Panicle* stout, glabrous, branches spreading and ascending, bracts marcescent in fruit *Petals* blue *Stamens* 2 3 with 2 or 3 staminodes filaments all bearded *Capsule* ¼ in diam, mucronate *Seeds* reticulate, glandular puberulous

9 **A. esculentum,** *Wall Cat* 5208, root tuberous, stem subsolitary, leaves linear complicate, panicle glabrous spreading, bracts oblong or the lower 1–2 foliaceous, capsule ellipsoid, cells 3 5 seeded *Clarke Monogr* 206 ? A melanostictum, *Hance in Seem Journ Bot* 1869, 167 Commelina esculenta, *Heyne mss*

MADRAS, in rice fields, *Heyne, Wight* CEYLON *Walker* —DISTRIB Australia, China

Root of clavate tubers crown with imbricating scarious scales *Stem* ...

10 **A. dimorphum,** *Dalz in Hook Journ Bot* 1851, 138 ...

The DECCAN PENINSULA; from the Concan southward, *Wight, &c* CEYLON, alt 5000 ft, *Thwaites*

Stem slender, branched at the base, 6–12 in *Leaves* 1–2½ by ¼–½ in, from oblong to ovate lanceolate, base rounded or cordate, mouth of sheath ciliate *Panicle* sparingly dichotomously branched, few-fld, bracts small cucullate persistent *Petals* blue *Stamens* 3, fertile, filaments bearded, staminodes 3 filaments naked *Capsule* ⅙ in triquetrous, acute *Seeds* black with brown furfuraceous lines —Wight figures all the filaments bearded, but describes them as above

11 **A. spiratum,** *Br Prodr* 271 (*in note*), root fibrous, stem ...

... Beng ...

leaves, upper bracts truncate, pedicels viscid *Petals* blue *Stamens* 2 fertile; staminodes 4, all bearded *Capsule* ½ in acuminate *Seeds* yellow brown, pitted

b *Flowering stem leafy, flowers corymbose or panicled*

4 **A. Thomsoni,** *Clarke in Journ Linn Soc Bot* xv 121, *Monogr* 202, t 4, f 2, stout leaves petioled broadly lanceolate or ensiform caudate acuminate with large bearded sheaths, upper bracts lanceolate caducous capsule elongate narrowly oblong acuminate and beaked cells 5–9 seeded seeds smooth Achsia? Thomsoni *Clarke Comm & Cyrt Beng* t 31 Dichoespermum giganteum *Hassk Commelin Ind* 42—Aneilema, sp 11, *Herb Ind Or Hf & T*

EASTERN HIMALAYA, Sikkim, alt 5–8000 *J D H*, &c Bhotan, *Griffith* NAGA HILLS alt 7000 ft *Clarke*

Stem 1 2 ft, erect *Leaves* 6–10 by 2–3 in, gl brous or scaberulous penni nerved above the base *Panicle* 3–6 in, glabrous, branches spreading widely in fruit bracts caudate *Sepals* glabrous *Petals* purple *Stamens* 3 fertile, uni lateral, staminodes 3 sometimes polleniferous, filaments naked *Capsule* ¾ 1 in *Seeds* shortly cylindric black, with white powder

5 **A. divergens,** *Clarke Comm & Cyrt Beng* t 16, *Monogr* 203, stem tall, leaves ensiform, sheaths [illegible] branches opposite or subwhorled bract at both ends, cells 3–5 seeded *Linn Soc* xi 448 A longif florum, *Herb Ind Or Hf & T*

TROPICAL and SUB TROPICAL HIMALAYA, from Chamba alt 6000 ft, *Clarke*, eastwards to Sikkim KHASIA HILLS, alt 4–5000 ft UPPER BURMA *Anderson*

[illegible] y ½ ¾ in, erect ovate, persistent. *Capsule* nearly

6 **A. Hookeri,** *Clarke Comm & Cyrt Beng* t 171, *Monogr* 204, stem tall stout, leaves ensiform base broad or subcordate, sheaths bearded, panicle erect branches slender spreading repeatedly dichotomous

KHASIA HILLS alt 5 6000 ft *J D H* and *T T*

Distinguished from *A divergens* by the broader leaf bases and spreading panicle *Stem* 6–12 in, leafy to the top

7 **A. zeylanicum,** *Clarke Monogr* 204, leaves narrowly oblong narrowed at both ends glabrous or pubescent, branches of panicle spreading alternate branches flexuous bracts minute, capsule subglobose cells 3–5 seeded, seeds slightly pitted A montanum, & protensum, *Thwaites Enum* 322 A dimorphum, *Thw l c non Dalz*

CEYLON common up to 3000 ft

Roots fibrous *Stem* 6–12 in, often branched from the base, branches leafy *Leaves* 1–3 by ¼ 1 in sheaths bearded at the mouth *Panicle* glabrous bracts glabrous, hardly sheathing persistent *Stamens* 3 fertile, staminodes 2–3 *Capsule* ⅛–⅙ in, obtuse, concave mucronate *Seeds* brown, with white powder—Var *B longiscapa*, Clarke l c, capsule ⅛ in—Courtalam, *Wight*

8 **A. lineolatum,** *Kunth Enum* iv 69, stem stout, leaves large narrowly oblong or ensiform acuminate, margins white, pan cle glabrous

or subglobosely trigonous, cells *ung* 146 *Commelin Ind* 36; atum, *Kunth l. c.* 70, *Dalz in Bomb Fl* 254 A latifolium,

Journ Linn Soc Bot xi 448 (var *a*) i. 175, *Ed Wall & Carey* i 179 C elata, *Vahl Enum* ii 178 Tinantia Prionostachys herbacea, *Hassk mss*

TROPICAL INDIA, from Sikkim, Bhotan and the Khasia hills, alt 2–4000 ft to BURMA Western Ghats from the Concan to Travancore —DISTRIB Mala Islands

Root of slender tubers *Stem* erect, stout *Leaves* 4–12 by 1 1½ in, margin scabrous or smooth often crisped, base cuneate rounded or cordate, upper ovate lanceolate *Panicle* stout, glabrous, branches spreading and ascending, brac marcescent in fruit *Petals* blue *Stamens* 2 3 with 2 or 3 staminodes, filamen all bearded *Capsule* ¼ in. diam, mucronate *Seeds* reticulate, glandula puberulous.

root tuberous, stem subsolitar preading, bracts oblong or th ls 3–5-seeded *Clarke Monog Journ Bot* 1869, 167 Com melina esculenta, *Heyne mss*

MADRAS, in rice fields, *Heyne*, *Wight* CEYLON, *Walker* —DISTRIB Australi China

Root of clavate tubers, crown with imbricating scarious scales *Stem* wit prostrate suckers *Leaves* 3 4 in, recurved, obtuse, almost glabrous *Panicle* wit alternate branches, bracts oblong, persistent *Stamens* 3 fertile, staminodes filaments bearded *Capsule* ¼ in *Seeds* dark brown, obscurely scabrid or pitted – Probably the same as the Australian *A gramineum*, Br

10 **A. dimorphum,** *Dalz in Hook Journ Bot* 1851, 138, roo fibrous, stems many, leaves linear oblong flat, bracts ovate, panicle ver short and broad, capsule ellipsoid or oblong cells 3–5 seeded, seeds smooth *Dalz & Gibs Bomb Fl* 254, *Clarke Monogr* 206 A paniculatum *Wight Ic* t 2075 A scapiflorum, *β*, *Thwaites Enum* 322 (*not of Wight*) A nudiflorum, *Miq in Pl Hohenack Exsicc* No 144 (*not of Br*) —Aneilema, sp *Miq l c* n 134

The DECCAN PENINSULA, from the Concan southward, *Wight*, &c CEYLON alt 5000 ft, *Thwaites*

Stem slender, branched at the base, 6–12 in *Leaves* 1–2½ by ¼–⅓ in, from oblong to ovate-lanceolate, base rounded or cordate, mouth of sheath ciliate *Panicle* sparingly dichotomously branched, few-fld, bracts small, cucullate persistent *Petals* blue *Stamens* 3, fertile, filaments bearded, staminodes 3 filaments naked *Capsule* ⅓ in, triquetrous, acute *Seeds* black, with brown furfuraceous lines —Wight figures all the filaments bearded, but describes them as above

11 **A. spiratum,** *Br Prodr* 271 (*in note*), root fibrous, stem

Petals blue *Staminodes* with glabrous or bearded filaments. *Capsule* ¼ in long mucronate valves hard polished

Sect II DICHÆSPERMUM *Cells* of ovary 4–20-ovuled *Seeds* 2 seriate in each cell

* *Flowers axillary, solitary or clustered, pedicels jointed in the middle*

18 **A. Hamiltonianum,** *Wall Cat* 5222, stem creeping rooting, leaves linear oblong flat glabrate, pedicels axillary and terminal fruiting hardly exserted capsule linear oblong seeds scabrid or flocculent biseriate *Clarke Monogr* 213 Dichæspermum Blumei *Hassk Comm Ind* 41, *Clarke Comm & Cyrt Beng* t 27 Tradescantia terminalis, *Blume Enum* i 6 Callisia orientalis, *Herb Ham*

UPPER GANGETIC PLAIN to ASSAM, in marshes, Chota Nagpore, *Clarke*—DISTRIB Java

Stem 6–12 in stout sparingly branched *Leaves* 1½ 2 in, sessile, acute or sub acute base cuneate *Peduncle* ⅙–¼ in rigid *Petals* white or rosy *Filaments* all naked *Capsule* ¼–⅓ in acute *Seeds* about 16 in each cell

Var *minor*, Clarke l. c 214, stems shorter, seeds about 30 in each cell, nearly smooth —Dichæspermum repens *Clarke Comm & Cyrt Beng* t 28 (*not of Wight*) —Assam, *Hamilton*

19 **A. ochraceum,** *Dalz in Hook Journ Bot* 1851, 135, stem [illegible] ovate oblong obtuse [illegible] rted, capsule broadly [illegible] *omb Fl* 253, *Clarke* [illegible] *t Ic* t 2078 (*not of Hassk*) D ochraceum, *Hassk Commelin Ind* 41

The DECCAN PENINSULA; from the Concan southwards TENASSERIM, *Griffith, Helfer*

Stem 4–8 in rooting at the lower nodes *Leaves* ⅔–½ by ⅓–½ in, glabrous or nearly so bases subamplexicaul *Pedicels* ¼–⅓ in slender *Sepals* narrow *Petals* yellow *Stamens* and *staminodes* 3 each, filaments naked *Capsule* ¼ in long *Seeds* 7 8 in each cell, pale yellow —Dalzell describes the filaments as bearded in the Journal of Botany, but not in the Bombay Flora

20 **A. lanuginosum,** *Wall Cat* 5221, hirsute or glabrate, stem suberect, leaves linear oblong or lanceolate acuminate, pedicels exserted, flowers large filaments bearded, capsule oblong acute many seeded, seeds nearly smooth *Clarke Monogr* 214 Commelina lanuginosa, *Heyne mss*

The DECCAN PENINSULA; from the Concan southwards, in hilly districts, ascending the Nilghiris to 6000 ft

Roots of thickened fibres *Stem* 6–16 in stout branched *Leaves* 1½–2½ in, rigid, deeply grooved when dry, acuminate strongly striate usually complicate and recurved base broad, margins waved *Pedicels* bracteolate at the joint *Sepals* straw-colrd *Petals* yellow, blue when dry *Capsule* ¼ in, or more *Seeds* angular

** *Flowers panicled*

21 **A. Kœnigii,** *Wall. Cat* 5214, stem short much branched glabrous, leaves ovate- or linear-lanceolate obtuse or acute, branches of panicle slender, filaments all bearded, capsule linear-oblong, seeds very numerous biseriate minutely tessellate *Clarke Monogr* 215 A nudiflorum, *Miq Pl Exsicc Hohenack* 144, c Dichæspermum lanceolatum, *Wight Ic* t 2078 D Kœnigii, *Hassk mss*

The DECCAN PENINSULA, from the Concan and Canara southwards

Root fibrous *Stem* 6–10 in, and branches slender *Leaves* 1 2 in, sessile, base rounded or cordate *Panicle* large for the size of the plant much dichotomously branched, branches flexuous, slender, bracts ovate, acute, persistent *Flowers* small, blue *Capsule* ⅙ in, pale yellow *Seeds* 15–16 in each cell, small, yellow, neither rugulose nor reticulate

22 A. [illegible]

semiteres, *Hassk Commelin Ind* 41 D paniculatum, *Herb Ind Or. H f & T*

The DECCAN P[illegible]

Roots fibrous [illegible] *Leaves* 2–4 by $\frac{1}{16}$–$\frac{1}{8}$ in, [illegible] Dalzell

Branches capillary [illegible] all, blue

Filaments according to Dalzell all connate at the base *Capsule* ⅙ in long *Seeds* about 6–8 in each cell, pale yellow —Habit of a *Juncus*

Sect III. DICTYOSPERMUM Cells of *ovary* 1-ovuled, of *capsule* 1-seeded or empty

* *Capsule glabrous*

23 A. [illegible]

[illegible] 6, *Hassk Commelin* [illegible] 5209, and 5224 A. [illegible] *Dalz & Gibs Bomb Fl* 253 Commelina vaginata, *Linn Mant* 177 Tradescantia gangetica, *Linn mss*

Throughout TROPICAL INDIA, Bengal, Assam and the Deccan Peninsula CEYLON, in rice fields and wet places —DISTRIB China

Roots fibrous *Stems* 6–18 in, decumbent and rooting at the lower nodes, branches suberect *Leaves* 3 6 [illegible]

24 **A. montanum,** *Wight in Wall Cat* 5203, stem erect, leaves large petioled elliptic-lanceolate glabrous or scaberulous, panicle terminal, branches long lax few-fld pubescent, stamens 3 perfect, filaments naked, staminodes 0, capsule globose, glabrous pedicels suberect, cells 1-seeded,

'ker MALACCA, Maingay (Kew distrib

eaves 10–30 by 1½–3 in, subcaudately hirsute *Flower heads* 1½ 2 in diam *Sepals* ⅓ in long

Var *rostrata*, Clarke l c, leaves narrower more caudate acuminate, flowers fewer F rostrata, *Hassk in Flora*, 1864, 631, *Commelin Ind* 94 —Mishmi hills, *Griffith* (*Kew distrib* 5486) Java

4 **F. Hookeri,** *Hassk in Flora*, 1864 629, *Commelin Ind* 89, beneath hairy, head of onger than the nearly t 41, *Monogr* 237

BHOTAN, ASSAM,

fld heads, and the

5 **F. glabrata,** *Hassk in Flora*, 1864, 360, *Commel Ind* 92, leaves escent, capsule ellipsoid much shorter *l & Cyrt Beng* t 42, *Monogr* 238 *h* 154 (*not of Kunth*) C marginata Amischotolypa glabrata, *Hassk in Flora* 1863, 33

TROPICAL SIKKIM HIMALAYA MUNNIPORE, BENGAL, ASSAM and TENASSERIM —DISTRIB —Sumatra, Java Tonkin

Differs from *F Hookeri* in the short narrow capsule ⅓ in long

5 CYANOTIS, *Don*

fascicled in the ochrea *Sepals* subequal, free or connate below *Petals* subequal often united in a tube below, limb orbicular *Stamens* 6 all perfect subequal, hypogynous or epipetalous filaments usually bearded often inflated towards the apex anthers oblong *Ovary* 3 celled, ovules 2 collateral in each cell one erect the other pendulous *Capsule* 3 celled loculicidal cells usually 2 seeded *Seeds* superposed, cubical or pyramidal, usually rugose

Many of the following species may probably have to be reduced

Sect I ENCYANOTIS *Cymes* enclosed in biseriate falcate imbricating bracteoles

* *Valves of the capsule separating from a free central columnar 3 toothed axis*

1 **C. papilionacea,** *Schultes, f Syst.* vii 1151, hirsute with spreading hairs creeping and rooting, leaves linear oblong or lanceolate, bracteoles subreniformly falcate acute ciliate, capsule oblong, seeds smooth or obscurely pitted *Clarke Monogr* 246; *Wight Ic* t 2089, *Wall Cat*

8987; *Hassk. Commelin. Ind* 158 C hispida, *Dalz in Hook Journ. Bot* 1851, 139, *Dalz & Gibs Bomb Fl* 253 (*excl Syn*) C hirtella, *Miquel Plant Exsicc Hohenack* No 130, *Hassk l c* 112 Tradescantia papilionacea, *Linn Mant* 513, *Vahl Symb* i 27 (*excl Syn*) T cristata, *Heyne mss* T rupestris, *Law in Grah Cat Bomb Pl* 222 —? Commelina cristata, *Blume Fl Ind* t 7, f 4

The DECCAN PENINSULA, from the Concan southwards, in rocky places

Annual *Stem* 4–6 in, branched from the base *Leaves* 1 1½ by ⅓–½ in, sessile, acute, acuminate, or obtuse and apiculate, base rounded, sheaths very short *Peduncles* long slender bracts shortly exceeding the cymes *Sepals* lanceolate. *Petals* blue *Filaments* filiform, bearded *Seeds* yellow-brown

Var *Burmanniana*, Clarke l c, leaves shorter broader C Burmanniana, *Wight Ic* t 2089 —Malabar.

2 **C. vaginata,** *Wight Ic* t 2088, softly hairy, erect or ascending, leaves ovate or oblong-lanceolate, sheaths short inflated, bracteoles ovate falcate acute ciliate, capsule oblong seeds rugose dark brown. *Hassk. Commel Ind* 98, *Clarke Monogr* 247

MALABAR, *Wight*

Annual, stem 4-6 in, lower part with inflated leafless sheaths *Leaves* falcate. *Peduncles* slender, bracteoles glabrous, striate and cross striolate *Sepals* lanceolate *Petals* blue *Filaments* filiform, bearded *Seeds* conic

** *Capsule with no free central column after dehiscence*

3 **C. cristata,** *Schultes, f Syst* vii 1150, stem creeping below, branches erect or ascending glabrous or with spreading hairs, leaves ovate oblong subacute, seeds striate and pitted *Wight Ic* t 3082, *Clarke Commel & Cyrt Beng* t 36, *Monogr* 247, *Dalz & Gibs Bomb Fl* 256, *Wall Cat* 8986, *Hassk Commelin Ind* 120 C racemosa, *Clarke Commel & Cyrt Beng* t 38 C Hugelii, *Hassk l c* 128 C cristata, *Linn Sp Pl* 42 Tradescantia cristata, *Jacq Hort Vind* ii 64, t 137, *Bot Mag* t 1435 T imbricata *Roxb Fl Ind* ii 120 T umbellata, *Heyne mss* —Cyanotis sp, *Wall Cat* 8989 —*Rheede Hort Mal* vii t 58

Throughout TROPICAL INDIA in hills districts BURMA, MALACCA, CEYLON DISTRIB Malay Islands Mauritius, trop Africa

[illegible] ⅔ in, sessile, [illegible] as long as the [illegible] *epals* lanceo- [illegible] at the tip *Capsule* ⅛ in, obtuse

Var. *Griffithii* Clarke l c 248, seeds smaller not pitted —Mergui, *Griffith* (*Kew distrib* 5505, 5517)

4 **C. barbata,** *Don Prodr* 46, creeping and rooting, glabrous or [illegible] llary and [illegible] s reticu- [illegible] *ogr* 248, [illegible] *Clarke in Journ Linn Soc* xi 453 (*not of Kunth*) C nobilis, *Hassk. l c.* 148 (*excl Syn Wight*), *Clarke Commel & Cyrt Ind* 6, 39 C glaberrima, *Hassk l. c* 150 C fasciculata, *Wall Cat* 8990 Tradescantia barbata. *Spreng. Syst Cur post* 138 T radicans, *Royle Ill* 403 —Cyanotis sp *Wall. Cat.* 8988, 8994

SUBTROPICAL HIMALAYA from Kashmir eastwards, ascending to 8000 ft KHASIA MTS alt 4600 ft BURMA & PENANG *Wallich* —DISTRIB China

Stems slender, branched, tufted sometimes bulbiferous *Leaves* 1–2 by ⅛–¼ in, falcate or straight sessile acute or acuminate, ciliate, cobwebby beneath *Bracts* much longer than the cyme *Bracteoles* falcately ovate, acuminate *Ovary* tipped with hairs *Capsule* quadrate *Seeds* brown —*C nobilis* and *glaberrima* are very large stout forms 1–2 ft high with leaves sometimes 6 in long common in the Khasia hills

5 **C tuberosa,** [illegible] 1152 suberect or prostrate, tall, radical leaves ensiform [illegible] ort leafy bract, terminal [illegible] e, filaments bearded, tip tumid, style bearded thickened at the tip, seeds obscurely rugose *Clarke Monogr* 249, *Wall Cat* 8991 *Dalz & Gibs Bomb Fl* 256, *Hassk Commelin Ind* 100 C concanensis, Thomsonii & Stocksii, *Hassk l c* 144 133, 118 Tradescantia tuberosa *Roxb Cor Pl* ii t 108, *Fl Ind* ii. 19 —Cyanotis sp No 8 9, *Herb Ind Or Hf & T*

The DECCAN PENINSULA, on the west side from the Concan to Travancore

Stem 6 in –3 ft suberect or prostrate, hirsute at the base *Leaves* radical and lower cauline, 6–10 by ½–1 in sessile often purple beneath, scaberulous *Cymes* villous, or densely hirsute, bracts ovate or lanceolate falcate, shorter than the cyme, bracteoles ¼–⅓ in *Petals* blue purple *Capsule* hairy above —A large coarse species

Var *adscendens* Clarke l c smaller more glabrous branches rooting and proliferous at the nodes C adscendens, *Dalz in Hook Journ Bot* 1852, 343; *Dalz & Gibs Bomb Fl* 255, *Hassk Commelin Ind* 102 C sarmentosa *Wight Ic* t. 2087 *Hassk l c* 151—With the type, and at Agra *Jacquemont* Chota Nagpore, *Clarke*

6 **C. Wightii,** *Clarke Monogr* 250, tall, very stout, suberect, sparsely hirsute leaves very long ensiform, cymes axillary and subcorymbose bracteoles falcately ovate acuminate ciliate, filaments bearded, style thickened below the tip seeds oblong dotted C longifolia, *Wight Ic* t 2084

[illegible], but usually [illegible] t loose *Bract* [illegible] ate *Capsule*

7 **C. arachnoidea,** *Clarke Monogr* 250, suberect, cottony or cobwebby, leaves very variable linear oblong or lanceolate rather obtuse cymes subsessile terminal and axillary bracteoles falcately lanceolate, filaments bearded style bearded and thickened below the tip capsule [illegible] *Wall Cat*, [illegible] 3) ?C [illegible] *Ir H f*

The DECCAN PENINSULA, Nilghiri hills *Wight* (*Kew distrib* 2839) CEYLON, Haragam, *Trimen*.

Differs from *C Wightii* in the soft shining silky or cobwebby pubescence Trimen s specimens are very robust with radical leaves 12 by 1½ 2 in, exactly as in the large states of *C Wightii*, but those of the Deccan specimens are much smaller and narrower

8 **C. pilosa**, ... or less clothed with ... or linear-lanceolate, ... oblong falcate acute, ... low the tip, capsule quadrate, seeds shortly conic obscurely pitted *Wight Ic* t 2083, *Clarke Monogr* 251, *Hassk Commelin Ind* 99, *Wall Cat* 8992, Cyanotis sp 11, *Herb Ind Or H f & T* Tradescantia pilosa, *Heyne mss*

The DECCAN PENINSULA, Nilghiri hills, *Heyne Wight, &c* CEYLON, in the higher parts of the island

Habit of *C arachnoidea* from which it differs in the hairyness and quadrate capsule and seeds The Ceylon are the only good specimens, and they are nearly glabrous

9 **C. villosa**, *Schultes, f Syst* vii 1155, silky or villous with spreading hairs, leaves narrowly lanceolate or ovate or oblong lanceolate, ...

The DECCAN PENINSULA on the E slope of the Nilghiris, *Wight, &c* CEYLON, Central province, ascending to 6000 ft

Stems 3-4 ft erect from a procumbent base, succulent, often rooting and proliferous at the nodes *Leaves* 3 5 by ½-½ in sessile, shining green, silkily ciliate *Bract* twice as long as the cyme bracteoles ¾ in long *Capsule* obtuse

10 **C. zeylanica**, *Hassk Commel Ind* 145, stem elongate glabrous except a line of hairs, leaves narrowly lanceolate puberulous pilose beneath, cymes small terminal subsessile, bracteoles dimidiate ovate, capsule subquadrate seeds striate and obscurely pitted *Clarke Monogr* 253 C lanceolata, Wight, *var* subglabra, *Thwaites Enum* 323

CEYLON, Central province, up to 6000 ft, *Thwaites*

Differs from *C villosa* in the short capsule and striate seeds, glabrous stem and smaller leaves narrowed at the base The bracts also are much shorter, hardly exceeding the cyme

11 **C. vaga**, *Schultes, f Syst* vii 1153, softly hairy, stems elon- ... axillary and ... ly straight, ... e and 1-2- ... *Enum* 1 5 ... *Zollinger*)

TENASSERIM, *Helfer* —DISTRIB Java, China

Stems 10 20 in, slender *Leaves* 1½ 2 by ⅓-¾ in *Bract* large *Capsule* obtuse *Seeds* with two deep clefts or pits The obscurely biseriate bracts ally it to the section *Dalzellia*

12 **C. fasciculata**, *Schultes, f Syst* vii 1152, annual, dwarf, decumbent, floccosely silky or hairy, leaves linear or lanceolate cymes ...

l c 100 C rosea, *Wight Ic* t 2086 C eriantha and C disrumpens (*in part*), and C Thwaitesii, *Hassk l. c* 62, 138, 105, 136 Tradescantia fasciculata, *Heyne in Roth Nov Sp* 189 T rupestris?, *Law in Grah Cat Bomb Pl* 223

The DECCAN PENINSULA, common in rocky places from the Concan southwards CEYLON, abundant in the Central province

Annual, roots fibrous *Stem* 4 18 in *Leaves* 1-2 by $\frac{1}{8}$-$\frac{1}{4}$ in *Bracts* about twice as long as the small cyme, silky or cobwebby *Petals* rose purple. *Filaments* bearded

A very variable plant, of which there are the three following varieties — *β glabrescens* (from Belgaum) with linear glabrous leaves, glabrous bracts and

fusiform above

Sect II DALZELLIA *Flowers* solitary or in terminal or subterminal few fld cymules, bracts and bracteoles small not imbricate in 2 series

13 **C. kewensis,** *Clarke Monogr* 243, *Tab* 5, *f* 6, villous, stem

sessile ovate

few terminal

...sis, *Hassk in*

t 6150

TRAVANCORE, on the Mybendra Mts, alt 3-4000 ft, *Beddome*

Stem and *branches* 6 10 in, pendulous, with ascending tips, rooting below *Leaves* 1-1½ in rather fleshy green and convex above, hairs rufous when dry,

...n the uppermost axils, pedicel

nts bearded with blue

...psule oblong obtuse,

14 **C. vivipara,** *Dalz in Hook Journ Bot* 1851, 226, epiphytic, subscapigerous radical leaves ensiform, flowering stems numerous very slender flexuous pendulous with small distant leaves and few very small flowers *Dalz & Gibs Bomb Fl* 255, *Clarke Monogr* 244, t 5, f. 5 Dalzellia vivipara, *Hassk in Flora*, 1865, 594, *Commelin Ind* 161

...several,

...y small,

...oblong,

...style

Sect III OCHREAFLORA *Flowers* axillary in the sheaths of the leaves, bracteoles small slender not imbricating (See also *C villosa*)

15 **C. axillaris,** *Roem & Sch Syst* vii 1154, stem elongate glabrous or sparsely hairy, leaves elongate linear or linear lanceolate, flowers clustered in the short inflated sheaths filaments bearded style glabrous filiform, capsule acute seeds subcylindric punctate *Clarke Monogr* 244,

Comm & Cyrt Beng t 35 *Dalz & Gibs Bomb Fl* 256, *Benth Fl Austral* vii 82, *Hassk in Pl Jungh* i 154, *Commel Ind* 107, *Wall*

Throughout INDIA, in the plains from the upper Gangetic valley to ASSAM and southwards to CEYLON —DISTRIB E Asia trop Australia

Stem 6 18 in, annual, stout or slender, branched *Leaves* 2–6 by ¼–¼ in, acuminate, sheaths ciliate base broad or narrowed *Petals* long clawed blue *Ovary* glabrous, style ovoid below the tip *Capsule* ⅙ in long glabrous, valves 2 fid

16 **C. cucullata,** *Kunth Enum* iv 107, glabrous or sparsely hairy leaves linear, flowers clustered in the sheaths, filaments nearly naked, capsule depressed in the centre with 3 horns seeds subquadrate pitted *Roth Nov Sp* 189, *Clarke Monogr* 245, t 5, f 7

The DECCAN PENINSULA, from Canara to Malabar

Habit and characters of *D axillaris*, but differing in the glabrous filaments and broader capsule and shorter broader seeds

DOUBTFUL SPECIES

C NILAGIRICA, *Hassk Commelin Ind* 127 differing according to Hasskarl from *C arachnoidea* in its glabrousness, obtuser leaves, denser spikes, and larger flowers

C KARLIANA, *Hassk l c* 146 stems creeping 8–12 in glabrous leaves ⅓–2 by $\frac{1}{10}$–¼ in linear lanceolate sheaths purple cymes 1–3 nate axillary or terminal small cobwebby puberulous bracteoles few seeds longitudinally cracked not scrobiculate, style glabrous tip thickened —Poonah *Hugel*

C INCERTA *Hassk l c* 165, 'brown villous, peduncles 5 nate, (cymes?) "umbellately crowded at the top of a common peduncle bracts" (bracteoles?) 7–20 falcate lanceolate acuminate flowers woolly villous, style hairy thickened below the tip —Asia *Hugel*

6 STREPTOLIRION, *Edgew*

gonous beaked loculicidal *Seeds* angular, rugose

S. volubile, *Edgew in Trans Linn Soc* xx 90 t 2 *Wight Ic* t 2081, *Hassk Commel Ind* 6, *Clarke Comm & Cyrt Beng* 40, *Monogr* 261 S Griffithii *Kurz* Tradescantia cordifolia *Griff Journ* 2(8

TEMPERATE HIMALAYA from Garwhal to Bhotan, alt 5–9000 ft UPPER ASSAM, on the Patkoy hills, and MUNNIPORE —DISTRIB China

Stem 6 or more ft glabrous or sparsely hairy climbing over bushes terete, branched, often rooting at the nodes *Leaves* 4–6 in diam, base often deeply 2 lobed

... with villous capsules

7. **FLOSCOPA,** *Lour*

[illegible] or [illegible] d) [illegible] ne [illegible] yle simple *Capsule* [illegible] celled, crustaceous, loculicidal *Seeds* hemispheric —Species about 11, tropical.

1 **F. scandens,** *Lour Fl Coch* 193, glabrous or pubescent, stems prostrate, branches suberect, leaves subpetioled acuminate, cymes panicled villous or hirsute *Clarke Monogr* 265 F paniculata, *Hassk Pl Jungh* 157, *Commel Ind* 167 F Hamiltonii, undulata petiolata and Meyeni anas, *Hassk Commel Ind* 166, 167 Dithyrocarpus paniculatus, *Kunth Enum* iv 70, *Clarke Comm & Cyrt Beng* 34, *Dalz & Gibs Bomb Fl* 256 D Meyenianus and rufus, *Kunth l c* 78, 79 D petiolatus, Rothii and undulatus, *Wight Ic* t 2079 2080 Tradescantia paniculata, *Roxb Cor Pl* ii t 109, *Fl Ind* ii 119, *Roth Nov Sp* 188 T. rufa *Presl Rel Haenk* i 138 Commelina cymosa and densiflora, *Blume Enum* i 4 C hispida, *Ham mss*, and C Hamiltonii, *Spreng Syst* iv, and *Cur post* 25 and v 186 Aneilema hispidum, *Don Prodr* 45, *Wall Cat* 5204 A cymosum and densiflorum, *Kunth Enum* iv 69 Lamprodithyros paniculatus, *Hassk in Flora*, 1863 389

Throughout tropical INDIA, in swamps from E Nepal, Sikkim and the KHASIA HILLS to TRAVANCORE, MALACCA and CEYLON —DISTRIB Eastern Asia and tropical Australia

Stem stout, erect creeping below *Leaves* 2 6 by ½–1½ in, sessile or petioled, sheaths lax short, glabrous or hirsute, mouth ciliate *Panicles* shortly peduncled, pyramidal, with long erect or ascending many fld branches *Flowers* small, subglobose, racemose lower bracteate upper ebracteate, sepals villous, petals white, lilac or rosy *Capsule* ⅛ in long, orbicular, or ellipsoid acute, compressed, shining *Seeds* glaucous

ORDER CLXI **FLAGELLARIEÆ.**

Stem tall, leafy, erect or scandent *Leaves* many nerved or plaited, petiole sheathing *Flowers* small, in terminal panicles, uni- or bi sexual *Sepals* 6, persistent, imbricate *Stamens* 6, hypogynous, filaments free, anthers basifixed, erect *Ovary* superior, 3-celled, style short, 3 cleft, or styles 3, ovules solitary in the cells, anatropous *Fruit* a small berry, or a drupe with 1–3 pyrenes *Seeds* laterally attached testa membranous or thick albumen flowery, embryo lenticular —Genera 3, species 7–8, of the Old World and Pacific

Stem scandent Flowers 2 sexual Drupe 1 2 seeded 1 FLAGELLARIA
Stem erect Flowers diœcious Berry 1–3 seeded 2 SUSUM

1 **FLAGELLARIA,** *Linn*

Stem climbing by the cirrhose leaf tips. *Flowers* bisexual *Sepals* subpetaloid *Style arms* 3, entire or 2 partite *Drupe* with a thin succulent exocarp and bony 1–2 seeded endocarp —Species 2, a Fijian and the following —

F. indica, *Linn Sp Pl* 333, leaves sessile lanceolate with sheathing bases *Kunth Enum* iii 370, *Roxb Fl Ind* ii 154, *Dalz & Gibs Bomb. Fl.* 256; *Wall Cat* 5198, *Benth Fl Austral* vii 10, *Miquel Fl Ind Bat* iii 249, *Redouté Lil* v t 257, *Gaertn Fruct* i 16, t 16 —*Rheede Hort Mal* vii t 53

Throughout INDIA, chiefly near the coast, from the SUNDERBUNDS and CHITTAGONG, to CEYLON and SINGAPORE —DISTRIB Trop Asia and Africa

Glabrous, climbing lofty trees, stem thick as the thumb below, branches clothed with the closed leaf-sheaths *Leaves* 6–10 in, variable in breadth, lanceolate, tip a slender spiral tendril, many nerved, not plaited, sheath 2-auricled *Panicle* 6–18 in broad and irregularly branched, flowers clustered, sessile, bracts scale like *Sepals* about $\frac{1}{12}$ in long, white, subscarious *Stamens* exserted, anthers as long as the filaments, deeply 2 fid at the base, ovary narrow, trigonous *Fruit* pisiform, red

Var *minor*, stem very slender, leaves 3–5 by $\frac{1}{4}$–$\frac{1}{2}$ in, panicle 1–3 in broad F minor, *Blume in Roem. & S h Syst* vi 1493, *Miq Fl Ind Bat* iii 249, *& Suppl* 598 F angustifolia, *Wall Cat* 5199 —Malay Peninsula

2 SUSUM, *Blume*

Stem stout, erect, simple or branched above *Leaves* very long, sessile or petioled, many nerved *Flowers* diœcious in broad panicles, sessile, bracts minute or 0 *Sepals* unequal, orbicular, concave, inner petaloid MALE FL *Stamens* 6, adnate to the base of the sepals *Pistillode* 3–6 angled or 3-lobed FL FEM *Staminodes* small or 0, stigmas 3, connate in a 3-lobed disk *Berry* pisiform, succulent 1 3 seeded, stigmas persistent, lateral or excentric —Species 2, Indian and Malayan

1 **S. anthelminticum,** *Blume in Schultes f Syst* vii 1493, panicle broad spreading irregularly branched *Kunth Enum* iii 371, *Miquel Fl Ind Bat* iii 247, *Thwaites Enum* 340 Hanguana, *Blume Enum Pl Jav* 15

MALAY PENINSULA and PENANG, common CEYLON, in marshes —DISTRIB Malay Islands

Glabrous, or young leaves and panicle sparsely clothed with short cottony pubescence *Stem* 3 5 ft high, stout, leafy at the tip, or throughout *Leaves* 3–8 ft long, long petioled, lanceolate, acuminate, coriaceous many and closely nerved, with conspicuous (when dry) cross nervules, petiole 1 3 ft, base sheathing *Panicle* erect, shortly stoutly peduncled, decompound rachis and branches stout *Flowers* about $\frac{1}{4}$ in broad, rather remotely sessile on the branches of the panicle, yellowish, perianth segments orbicular, concave filaments short dilated below, anthers oblong *Berry* usually 1-seeded

2 **S. malayanum,** *Planch mss*, more or less pubescent with scattered white hairs, panicle narrow, branches whorled Veratronia malayana, *Miquel Fl Ind Bat* iii 553 Veratrum ? malayanum, *Jack in Mal Misc* i v. 25 (*Hook Bot Misc* ii 74), *Wall Cat* 3717 T anthelminticum, *Maury in Rev Hort* 1889 77, f 23

[illegible]

his [illegible]

des [illegible]

but I assume that Miquel must have had access to the specimens of that author, or he would not have described S *malayanum* as a different genus If really different the two species are very closely allied.

Monogr June 137, 139, *Kunth Enum* iii 336, *Thw Enum* 340 J Wallichianus, *La Harpe l c* 139, *Kunth l c* 338 J indicus, *Royle ex Don in Trans Linn Soc* xviii 323, *Wall Cat* 8999 J monticola, *Steud Syn Pl Glum* ii 301 Rostkovia ensiformis, *Herb Ham*—Juncus *Wall Cat* 9000

Plains of BENGAL and the PANJAB, ascending the Himalaya to 10 000 ft The KHASIA HILLS, and DECCAN Ghats, BURMA, CEYLON—DISTRIB Eastern Asia Australia

Very variable, cæspitose, rootstock very short *Stems* 18–24 in, sometimes decumbent and rooting at the nodes, leafy, not septate *Leaves* 2–10 by $\frac{1}{16}$–$\frac{1}{8}$ in, always shorter than the stem, acute *Cymes* erect, branches erect or spreading, lower bract leafy, erect, shorter than the cyme, floral hyaline, lanceolate, long [illegible] $\frac{1}{8}$–$\frac{1}{6}$ in long, [illegible] tigmas long [illegible] culate, testa [illegible]

unitubular, [illegible] *Monogr Ju*[illegible] dicus, *var* [illegible] iii 232—B [illegible]

13. **J. leptospermus**, *Buchen in Engl Bot Jahrb* vi 203, xii 389, stems tall, leaves cylindric unitubular, cymes decompound erect, heads crowded sub 5 fld, sepals subulate lanceolate shorter than the narrow lanceolate beaked prismatic capsule, stamens 3 much shorter than the sepals, seeds linear oblong

KHASIA HILLS alt 4–5000 ft *Griffith, Clarke*

Stem 2 3 ft as thick as a crow-quill, terete or subterete, smooth, leafy above, at length fistular *Leaves* shorter than the stem, septate, acuminate *Cyme branches* erect, stiff, lower bract leafy, floral hyaline, awned; flowers reddish prismatic, sepals $\frac{1}{8}$ $\frac{1}{6}$ in long very narrow, rigid, acuminate, margins narrowly membranous, filaments rather longer than the anthers *Capsule* 1 celled *Seeds* fusiform pointed at one end, testa close—A taller plant than *J prismatocarpus* less leafy, with a much shorter cyme the branches of which are more erect, and with narrower seeds

Sect V *Leaves* narrow channelled, terete or filiform, 1-many tubular, septa very indistinct or 0 *Cymes* consisting of solitary or a few globose or subglobose heads, flowers usually large, white yellowish or chesnut-brown *Stamens* 6 *Seeds* scobiform or tailed at each end

* Cyme a solitary sessile head Leaves solitary or few, all at or near the base of the stem Anthers included, or exserted

14 **J. triglumis**, *Linn Sp Pl* 328, stem slender stiff naked, leaves short subulate, cyme terminal 3–4-fld dark brown, bracts short, sepals oblong lanceolate acute glumaceous, stamens included filaments equalling or longer than the small anthers, capsule exserted obtuse or mucronate seeds with long tails *Kunth Enum* iii 358, *Buchen in Engl Bot Jahrb* vi 213, xii 388, *Boiss Fl Orient* v 355, *Reichb Ic. Fl Germ* ix t 392

ALPINE HIMALAYA and WESTERN TIBET, alt 12–15 000 ft, from Kashmir to Sikkim—DISTRIB Alpine and Arctic regions of the N hemisphere

Stems 2–6 in, tufted, not stoloniferous *Leaves* stiff, 2-tubular. *Cymes* $\frac{1}{4}$–$\frac{1}{2}$ in

diam, outer bracts dark brown, spreading usually shorter than the sessile flowers, sepals $\frac{1}{6}$–$\frac{1}{5}$ in, inner rather broader, tips membranous, style and stigmas short *Seeds* $\frac{1}{15}$ in long, including the long white tails

15 **J. leucomelas,** *Royle ex Don in Trans Linn Soc* xviii 320, stem filiform naked, leaves 1–2 filiform very short cyme a 3–8 fld white head, bracts brown lower usually produced, sepals linear oblong obtuse membranous, anthers very long exserted capsule ovoid oblong shortly exserted, seeds long tailed *Buchen in Engl Bot Jahrb* vi 211, xii 391 J Thomsoni, *Buchen in Bot Zeit* xxv (1867) 148 *in Engl Bot Jahrb* xii 390

WESTERN HIMALAYA and WESTERN TIBET, from Kashmir to Sikkim, alt 12–16,000 ft —DISTRIB Mongolia

Stems tufted, 2–6 in not stoloniferous hollow *Leaves* 1–2 tubular *Cyme*
long, inner with
tyle and stigmas
sh *J Thomsoni*

16 **J. bracteatus,** *Buchen in Engl Bot Jahrb* vi 220 xii 397, stem very slender (rarely 1 leaved?) leaves few short filiform, cyme a

SUBALPINE HIMALAYA alt 12 000 ft Garwhal *Duthie*, Sikkim *J D H*

Stems tufted 6 8 in fistular basal sheaths soft *Leaves* subcompressed tubular *Cyme* $\frac{1}{2}$ in broad, upper bracts rather membranous brown, equalling the shortly pedicelled flowers, sepals $\frac{1}{6}$ in long, anthers linear, as long as the filaments *Capsule* ovoid 1 celled *Seeds* scobiform testa shortly produced at each end —Buchenau places this in the group with a leaf on the stem this may occur occasionally, but I think that specimen of *J leucanthus* may have been mixed with *bracteatus* On the other hand the absence or presence of a stem leaf in the species of this section is I fear far from a good one, and *J bracteatus* is perhaps only a form of *leucomelas*

** Cyme a solitary sessile head Stem with one or more leaves above the middle Anthers exserted, linear

Sikkim, alt 11–13 000 ft

slender, stigmas short *Capsule* obovoid

Seeds obliquely ovoid testa loose shortly produced at each end —*Buchenau* has a var *alpina* (l c xii 395) from Jongri in Sikkim (alt 13 000 ft., *Clarke*) smaller with brown cymes and smaller flower

18 **J. membranaceus,** *Royle ex Don in Trans Linn Soc.* xviii

anthers exserted $\frac{1}{4}$ shorter than the slender filaments, capsule as long as the sepals narrowly lanceolate prismatic, seeds with slender tails

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24 **J. nematocaulon,** *Hook. f. in Hook Ic Pl ined*; stems capillary grooved flexuous, leaves capillary channelled, cymes of 1–3 distant 1–3-fld heads, bracts very short lower rarely capillary, sepals small pale green lanceolate acuminate not half as long as the prismatic acuminate pale capsule, anthers far exserted much shorter than the very slender filaments, style long, stigmas short

Flowers sessile, floral bracts membranous about as long as the pale sepals which equal the petals and are $\frac{1}{6}$ in long, 1-nerved *Capsule* with the beak $\frac{1}{4}$ in long,

Sect VI Perennial *Leaves* flat or with involute margins, grass like, strongly nerved *Cymes* of several capitate clusters

25 **J. minimus,** *Buchen in Bot Zeit* 1867, 145, *in Engl. Bot Jahrb* vi 209, xii 412, stem short stout, leaves chiefly basal, cymes of 1–2 3–6-fld dark chesnut sessile heads, lower bract usually foliaceous, sepals lanceolate glumaceous finely acuminate, petals shorter acute, stamens included, capsule exserted turgid obtuse or retuse, seeds very minute, testa forming an oblong very loose sac

Sikkim Himalaya, alt 16–18 000 ft, *J D H*

Rootstock short, stout, stems 2–4 in, densely tufted, naked or 1-leaved, grooved *Leaves* shorter than the stem, $\frac{1}{8}$–$\frac{1}{6}$ in broad flat, grooved *Cyme* with sessile heads $\frac{1}{4}$–$\frac{1}{3}$ in diam, flowers subsessile, sepals $\frac{1}{6}$ in long, petals rather broader, anthers small, much shorter than the filaments, ovary ovoid, style and stigmas short. *Capsule* rarely half as long again as the sepals, dark brown shining *Seeds* $\frac{1}{18}$ in long, testa white rounded at both ends —Imperfect flowers, or even cymes, occur amongst the basal leaves

26 **J. Clarkei,** *Buchen in Engl Bot Jahrb* vi 210, xii 413, stoloniferous, stem slender many leaved, leaves longer than the stem soft, flat, grass like, cyme of 1–5 globose peduncled 4 many fld straw-colrd heads, lower bract leafy, sepals lanceolate membranous, stamens exserted, capsule much exserted prismatic long-beaked, seeds with long slender tails

Sikkim Himalaya, alt 10 13,000 ft, *J D H.* Bhotan, *Griffith* Munnipore, on Jakpho, alt 9900 ft, *Clarke*

Stems 6–10 in, tufted terete, striate *Leaves* $\frac{1}{8}$–$\frac{1}{4}$ in broad, finely acuminate, flaccid, sheaths membranous *Cyme* with heads $\frac{1}{3}$–$\frac{1}{2}$ in diam; flowers pedicelled; sepals $\frac{1}{6}$–$\frac{1}{4}$ in long, outer lanceolate, inner more oblong, anthers linear, about $\frac{1}{4}$

shorter than the filaments, style long, slender, stigmas short *Capsule* membranous, pale, shining *Seeds* ⅙ in long, including the very long tails —Leaves often involute and very slender as in *J concinnus*, but seeds very different

2 LUZULA, *DC.*

Leaves grass like, hairy *Perianth* segments glumaceous *Stamens* 3 or 6 *Ovary* 1 celled, 3 ovuled —Species about 30, temperate and Asiatic

1 **L. plumosa,** *E Meyer in Linnæa*, xxii (1849) 387, cyme subumbellate, branches very slender, flowers solitary, testa produced into a horn like appendage *Buchen in Engl Bot Jahrb* vi 195 and xii 85 L pilosa, *var* plumosa, *C A Meyer ex Franch in Nouv Arch Mus Paris*, x (1887) 100 L Forsteri *Herb Ind Or H f & T* Juncus plumosus *Wall mss —Wall Cat* 9003

TEMPERATE HIMALAYA, alt 9 10 000 ft, from Kumaon eastwards KHASIA HILLS, alt 6000 ft, *Clarke* —DISTRIB China

Perennial, 6–18 in high *Leaves* linear acuminate, $\frac{1}{6}$–$\frac{1}{4}$ in broad glabrous or sparsely ciliate with very long hairs *Branches* of cyme capillary, very unequal, divaricate, few fld, bracts scarious much shorter than the flowers *Sepals* $\frac{1}{10}$–$\frac{1}{8}$ in, lanceolate, acuminate, pale brown *Stamens* 6 *Capsule* oblong obtuse or apiculate, about as long as the sepals

2 **L. effusa,** *Buchen in Engl Bot Jahrb* vi 196, xii 106, cyme very laxly paniculately branched, branches divaricate very long and slender flowers solitary sessile or pedicelled, testa with a terminal boss

SIKKIM HIMALAYA alt 9–10 000 ft, *J D H*, *Clarke* MUNNIPORE, on Jakpho, alt 9900 ft, *Clarke*

Perennial, 12 24 in high *Leaves* linear, $\frac{1}{3}$ $\frac{1}{2}$ in broad, glabrous or sparsely ciliate below *Cyme* long peduncled branches 1–3 in long, bracts ovate, acute, brown *Sepals* $\frac{1}{12}$ $\frac{1}{10}$ in long ovate-lanceolate, acuminate, pale or dark brown *Stamens* 6 *Capsule* oblong rather longer than the sepals obtuse, mucronate —The Munnipore specimens have leaves ½ in broad, and a closer inflorescence, with shorter capsules, the seeds appear to be diseased

3 **L. campestris,** *DC Fl Franc* iii 161, cyme subumbellately branched, flowers in peduncled capitate clusters, testa apiculate at the tip caruncled at the base *Buchen in Engl Bot Jahrb* v 108, xii 155, *Boiss Fl Orient* v 349, *Reichb Ic Fl Germ* ix t 375, 376 Juncus campestris, *Linn Sp Pl* i 329

TEMPERATE and ALPINE HIMALAYA, alt 10–14 000 ft from Kashmir eastwards The KHASIA NILGHIRI and ANAMALLAY HILLS alt 5 7000 ft —DISTRIB N temp regions

Perennial 6 18 in high *Leaves* $\frac{1}{6}$ $\frac{1}{4}$ in broad glabrous or ciliate *Branches*

4 **L. spicata,** *DC Fl Franc* iii 161 cyme a solitary oblong drooping or nodding bracteate head testa rounded at the tip caruncled at the base *Buchen in Engl Bot Jahrb* v 197, xii 127, *Boiss Fl Orient* v. 348, *Reichb Ic Fl Germ* ix. t. 379

ALPINE HIMALAYA, from Kashmir to Kumaon, alt 12-14,500 ft, *Royle*, &c — DISTRIB North Alpine and Arctic regions

Perennial, 2-10 in high *Leaves* densely fascicled, radical 1-4 in long, ver bract leafy, acts brown with long, ovate lan obtuse, shorter than the sepals

DOUBTFUL SPECIES

a state for determination

ORDER CLXIII PALMEÆ.

By Dr. O Beccari & J D Hooker

Shrubs or trees, solitary or gregarious, naked or prickly, rarely pubes-

usually sessile, the wall, base, or top of the cell, anat hard berry or of 1-3 carpels, pericarp smooth, rough, or clothed with shining scales that imbricate downwards *Seeds* erect or laterally attached, rarely pendulous, raphe usually branching all over the testa, albumen horny or bony, solid (equable) or ruminate, embryo small in a small cavity near the surface of the albumen —Genera about 130, species about 1100, chiefly tropical

species This, not always the framing statements or views

It was, ind ed, a great disappointment to me, that Dr Beccari declined to undertake the completion of his work, and the drawing up of specific diagnoses in the form adopted in the Flora of British India a task which he is so good as to assure me it would have gratified him to have accomplished, had he not definitely given up the further study of botany This has compelled me to associate my name with his as

undescribed

TRIBE I **Arecеæ** *Leaves* pinnatisect leaflets free with reduplicate sides or confluent as a plaited limb *Flowers* monœcious or diœcious *Seeds* with ventral raphe and dorsal embryo

A Spadix infrafoliar (that is flowering after the fall of the leaf in the axil of which it was formed)

Subtribe 1 EUARECEÆ *Male fl* unsymmetric, sepals small, petals imbricate *Stigma* in the fruit terminal —Spadix androgynous, flowers usually ternate the middle one female

* *Ovule basilar erect*

Male fl minute solitary or 2 nate towards the tips of the branches 3 or 6 androus fem larger solitary Albumen ruminate	1 ARECA
Male fl one on each side of a fem st mens 6 or more Albumen ruminate	2 PINANGA

** *Ovule parietal*

Male fl 6 androus sepals equalling or longer than the petals fem sepals and petals broadly imbricate Albumen ruminate	3 NENGA
Male fl 9 12 androus fem petals with valvate tips Albumen ruminate	4 LOXOCOCCUS

Subtribe 2 PTYCHOSPERMEÆ *Male fl* symmetric, sepals broad rounded imbricate *Stigma* in the fruit terminal *Ovule* parietal or pendulous from the tip of the cell —Spadix androgynous, flowers usually ternate, the middle one female

Stamens 6 Albumen ruminate Leaflets acuminate Seeds deeply grooved along the raphe	5 PTYCHORAPHIS
Stamens 6–15 Albumen equable Leaflets entire or obliquely 2 toothed	6 CYRTOSTACHYS

Subtribe 3 ONCOSPERMEÆ *Male fl* symmetric or not, sepals imbricate; stigma in fruit lateral or basilar

Male sepals small acute Stamens 6–12 Albumen ruminate Armed palms, leaflets acuminate	7 ONCOSPERMA

B Spadix interfoliar (flowering while the leaf in whose axil it is formed is still green) or infrafoliar in some *Caryotideæ*

Subtribe 4 IGUANUREÆ Spadix androgynous fem fl between two males male sepals broadly imbricate *Ovules* basilar or parietal *Stigma* in fruit lateral or basilar

Stamens 6 9 Ovules parietal Stigma in fruit basilar or subbasilar Leaflets obliquely truncate	8 IGUANURA

Subtribe 5 GEONOMEÆ Spadices unisexual, flowers sunk in cavities of its branches, perianth glumaceous, sepals imbricate *Stigma* in fruit basilar or lateral

Filaments free Leaflets acuminate	9 BENTINCKIA

Subtribe CARYOTIDEÆ Spadices unisexual, flowers solitary, or ternate with the fem placed above the others *Petals* of both sexes valvate

ALPINE HIMALAYA, from Kashmir to Kumaon, alt 12-14,500 ft, *Royle*, &c — DISTRIB North Alpine and Arctic regions

Perennial, 2-10 in high *Leaves* densely fascicled, radical 1-4 in long, $\frac{1}{12}$-$\frac{1}{8}$ in broad channelled ciliate or not *Cyme* $\frac{1}{2}$-$\frac{3}{4}$ in long, lower bract leafy, usually elongate floral as long as the flowers, lanceolate, aristate, bracts brown with broad white membranous ciliate margins and tip *Sepals* $\frac{1}{8}$ in long, ovate-lanceolate, aristate, very dark brown *Stamens* 6 *Capsule* oblong, obtuse, shorter than the sepals

DOUBTFUL SPECIES

L sp ?, Sikkim Himalaya alt 10-11,000 ft, *J D H*, *Pantling*, referred by Buchenau doubtfully to the European *L parviflora*, var *subcongesta*, but in much too young a state for identification The bracts are ciliate, the sepals ovate acuminate and the stamens are 3 only —*There are other Himalayan species in too imperfect a state for determination*

ORDER CLXIII PALMEÆ.

By Dr O Beccari & J D Hooker

Shrubs or trees, solitary or gregarious, naked or prickly, rarely pubes-

are enclosed in one or more large sheathing bracts (spathes), usually 3 bracteate *Perianth* inferior, segments 6 in two series (sepals and

cate downwards *Seeds* erect or laterally attached, rarely pendulous, raphe usually branching all over the testa, albumen horny or bony, solid (equable) or ruminate embryo small in a small cavity near the surface of the albumen —Genera about 130, species about 1100 chiefly tropical

"Malesia" The mss include materials for framing more or less complete descriptions of most of the Indian Palms with notes on others, and are very voluminous,

or views

undescribed

TRIBE I **Areceæ.** *Leaves* pinnatisect leaflets free with reduplicate sides or confluent as a plaited limb *Flowers* monœcious or diœcious *Seeds* with ventral raphe and dorsal embryo

A Spadix infrafoliar (that is flowering after the fall of the leaf in the axil of which it was formed)

Subtribe 1 EUARECEÆ *Male fl.* unsymmetric, sepals small, petals imbricate *Stigma* in the fruit terminal —Spadix androgynous, flowers usually ternate, the middle one female

* *Ovule basilar, erect*

Male fl minute, solitary or 2 nate towards the tips of the branches 3 or 6 androus fem larger solitary Albumen ruminate ... 1 ARECA

Male fl one on each side of a fem, st. mens 6 or more Albumen ruminate ... 2 PINANGA

** *Ovule parietal*

Male fl 6 androus, sepals equalling or longer than the petals fem sepals and petals broadly imbricate Albumen ruminate ... 3 NENGA

Male fl 9 12 androus fem pet l v il valvate tips Albumen ruminate ... 4 LOXOCOCCUS

Subtribe 2 PTYCHOSPERMEÆ *Male fl* symmetric, sepals broad rounded, imbricate *Stigma* in the fruit terminal *Ovule* parietal or pendulous from the tip of the cell —Spadix androgynous, flowers usually ternate, the middle one female

Stamens 6 Albumen ruminate Leaflets acuminate Seeds deeply grooved along the raphe ... 5 PTYCHORAPHIS

Stamens 6–15 Albumen equable Leaflets entire or obliquely 2 toothed ... 6 CYRTOSTACHYS

Subtribe 3 ONCOSPERMEÆ *Male fl* symmetric or not, sepals imbricate, stigma in fruit lateral or basilar

Male sepals small, acute Stamens 6–12 Albumen ruminate Armed palms, leaflets acuminate ... 7 ONCOSPERMA

B Spadix interfoliar (flowering while the leaf in whose axil it is formed is still green) or infrafoliar in some *Caryotideæ*

Subtribe 4 IGUANUREÆ Spadix androgynous fem fl between two males, male sepals broadly imbricate *Ovules* basilar or parietal *Stigma* in fruit lateral or basilar

Stamens 6 9 Ovules parietal Stigma in fruit basilar or subbasilar Leaflets obliquely truncate ... 8 IGUANURA

Subtribe 5 GEONOMEÆ Spadices unisexual, flowers sunk in cavities of its branches, perianth glumaceous, sepals imbricate *Stigma* in fruit basilar or lateral

Filaments free Leaflets acuminate ... 9 BENTINCKIA.

Subtribe CARYOTIDEÆ Spadices unisexual, flowers solitary, or ternate with the fem placed above the others *Petals* of both sexes valvate

* *Spathes many, flowers symmetric, stigma in the fruit terminal*

Male calyx tubular	Stamens 6	Albumen equable .	10 WALLICHIA
Male calyx cupular	Stamens many	Albumen equable	11 DIDYMOSPERMA
Male sepals 3	Stamens many	Albumen equable	12 ARENGA
Male sepals 3	Stamens many	Albumen ruminate	13 CARYOTA

** *Spathes 2, flowers unsymmetric, stigma in the fruit basilar*

Male calyx minute Stamens 3 or 6, extrorse Albumen equable — 14 ORANIA

ANOMALOUS GENUS

Male fl in catkin like branches of a drooping androgynous spadix, fem capitate at the apex of the spadix — 15 NIPA

TRIBE II **Phœniceæ.** *Leaves* pinnatisect, leaflets with induplicate sides *Spadices* interfoliar, spathe solitary *Flowers* diœcious *Ovary* of 3 free carpels, one only ripening *Seed* ventrally grooved, embryo usually dorsal

16 PHŒNIX

TRIBE III **Corypheæ.** *Leaves* flabelliform, orbicular or cuneiform, plaited lobes or segments with induplicate sides *Spadices* interfoliar, spathes many *Flowers* usually bisexual *Ovary* entire or 3 lobed, or of 1–3 smooth carpels *Fruit* smooth, except *Pholidocarpus* *Seeds* with a small hilum, raphe ventral

* *Stigma in the fruit basal Albumen equable*

Ovary 3 lobed, style short	Embryo apical		17 CORYPHA
Ovary 3 celled	style subulate	Embryo dorsal	18 NANNORHOPS

** *Stigma in the fruit terminal Albumen equable, embryo dorsal*

Ovary of 3 trigonous carpels, style filiform	19 LICUALA
Ovary of 3 globose carpels, styles 3, free or coherent	20 LIVISTONA

*** *Albumen ruminate, embryo basal*

Fruit small smooth	21 TRACHYCARPUS
Fruit large, tuberculate or tessellate	22 PHOLIDOCARPUS

TRIBE IV **Lepidocarpeæ.** *Leaves* pinnatisect, leaflets with reduplicate sides *Spadices* interfoliar or terminal, spathes usually many *Ovary* 1–3 celled *Fruit* clothed with reflexed shining closely imbricating appressed scales —Leaves copiously and strongly armed, except *Metroxylon*

* Polycarpic palms flowering annually

† *Leaflets acuminate, quite entire, nerves parallel*

Stem elongate	Spathes tubular, persistent	23 CALAMUS
Stem elongate	Spathes cymbiform or open deciduous .	24 DEMONOROPS
Stem short or 0	Spathes many, persistent .	25 ZALACCA

†† *Leaflets rhomboid cuneate or oblanceolate, toothed, nerves flabellate*

Stem short or 0	Spathes many, persistent .	26 KORTHALSIA
Stem scandent	Spathe solitary, deciduous . .	27 CERATOLOBUS

** Monocarpic palms flowering once and then dying

† *Spadices axillary from the uppermost leaves*

Stem scandent Spadix with long amentiform branches clothed with large closely imbricating inflated spathels [illegible] 28 PLECTOCOMIA

[illegible] 29 PLECTOCOMIOPSIS

[illegible] most minute 30 MYRIALEPIS

†† *Spadix very large, terminal*

Stems short, tufted Leaves armed 31 FULEISSONIA

Stem stout, erect Leaves unarmed 32 METROXYLON

TRIBE V **Borasseæ.** *Leaves* flabelliform *Spadices* interfoliar, diœcious, males minute, sunk in perianth glumaceous [illegible] tem very [illegible] a very stout spadix each clothed [illegible]

33 BORASSUS

TRIBE VI **Cocoineæ.** *Leaves* pinnatisect leaflets with reduplicate sides *Spadices* interfoliar, unisexual or androgynous, spathes 2 *Ovary* 3 celled stigmas terminal *Fruit* a drupe with a fibrous pericarp and terminal stigmas, endocarp woody or stony, with 3 terminal pits of which two answer to arrested cells the third is immediately over the position of the embryo in the subjacent albumen *Seed* adherent to the endocarp by the diffuse reticulations of the raphe which ramifies all over the seed

34 COCOS

1 ARECA, *Linn*

Stem erect annulate *Leaves* pinnate *Spadices* infrafoliar, branched, MALE FL many minute, sepals small, petals obliquely lanceolate valvate *Stamens* 3 or 6, anthers basifixed, erect FEM FL much larger, few at the base of the branches perianth acrescent, sepals and petals orbicular, imbricate, the petals with acute valvate tips, ovary 1 celled, stigmas 3, sessile, ovule basal, erect *Fruit* ovoid or oblong stigmas terminal *Seed* with a truncate base albumen ruminate, embryo basilar —Species about 24 tropical Asia and Australia

1 **A. Catechu,** *Linn Sp Pl* 1189, hexandrous, trunk tall, fruit ovoid *Roxb Cor Pl* t 54 t 75, *Fl Ind* iii 615, *Mart Hist Nat Palm* iii 169 t 102 *Kunth Enum* iii 184, *Blume Rumph* iii 65 t 102 A et t 104 *Griff in Calc Journ Nat Hist* v 153, *Palms of Brit Ind* 17, *Miq Fl Ind Bat* iii 8 *Kurz For Fl* ii 536, *Gamble Man Ind Timb* 421, *Scheff Arec* 9 in *Ann Jard Bot Buitenz* i 144 t i v iii. f 2 Areca Faufel *Gærtn Fruct* i 19, t 7, f 2 A hortensis *Lour Fl Cochinch* 568 —*Rheede Hort Mal* i t 5–8

Cultivated in the hot damp regions of ASIA and the MALAYAN ISLANDS

Trunk solitary, 40–100 ft *Leaves* 4–6 ft leaflets numerous 1–2 ft., upper

confluent, quite glabrous *Spathe* glabrous, compressed *Spadix* much branched, rachis stout compressed, branches with filiform tips bearing more or less distichous minute male fl *Fem fl* solitary at the bases and axils of the branches; sepals ½ in, ovate, obtuse, petals subsimilar, staminodes 6, connate *Fruit* 1½-2 in, smooth, orange or scarlet —Betel nut

2 **A. concinna,** *Thw Enum* 328, hexandrous, trunk short slender, fruit subfusiform

CEYLON, Reigam and Pasdoon Corles, *Thwaites*

Trunk 8-12 ft, 1½-1¾ in diam, green *Leaves* about 7, 3-3½ ft long, subglabrous, leaflets 2 ft long *Spadix* and flowers as in *A Catechu* *Fruit* 1½ in long, umbonate, reddish yellow

3 **A. nagensis,** *Griff in Calc Journ Nat Hist* v 156; *Palms Brit Ind* 149, triandrous, trunk tall, fruit narrowly ovoid

ASSAM, in the Naga hills, *Jenkins*

Trunk 30-40 ft *Leaves* 7 ft, leaflets 19 20 in *Spadix* 1 ft, branches stout, flexuose *Fruit* 1 in, narrowed at both ends—Description from Griffith, who states that the leaves were imperfect and open to doubt from their resemblance to *A gracilis* (*Pinanga gracilis*)

4 **A. triandra,** *Roxb Hort Beng* 68, *Fl Ind* iii 617, triandrous, stems tufted slender, fruit ellipsoid. *Ham in Mem Wern Soc* v. 310, *Mart Hist Nat Palm* t 149, *Griff in Calc Journ Nat Hist* v 154, *Palms Brit Ind* 148, t 230 A, *Kurz For Fl* ii 537.

CHITTAGONG, MARTABAN, TENASSERIM, the ANDAMAN ISLANDS, and the MALAYAN PENINSULA

Stems 12-25 ft. by 1-1½ in diam, green, sending out basal offshoots *Leaves* 4-6 ft, petiole slender, leaflets 1½-3 ft, lateral sometimes as well as the terminal confluent *Spathe* 1 foot or more *Spadix* and flowers as in *A Catechu*, but triandrous *Fruit* the size of an olive, orange colrd, at length scarlet, tip truncate

2 PINANGA, *Blume*

Stem erect, annulate *Leaves* pinnate with the upper leaflets confluent. *Spadices* infrafoliar, androgynous, spathe solitary, flowers 3 together (a fem between 2 males) clusters in 2-4 or 6 series MALE FL obliquely triquetrous [illegible] lanceolate, valvate, [illegible] FEM FL much sma[illegible] broadly imbricate, ovary 1 celled, stigmas 3, ovule basilar erect *Fruit* ovoid or ellipsoid, pericarp fibrous *Albumen* ruminate, embryo basilar — Species about 24, tropical Asiatic and Malayan

A SPIRANTHEÆ Becc *Flowers* in 3 or more spiral series on the spadix or its branches

1 **P. hexasticha,** *Scheff in Ann Jard Bot. Buitenz* i. 148, stems slender gregarious, leaves pinnate, petiole scaly, spadix simple reflexed, male fl in 5-6 series, fruit fusiform *Kurz For Fl* ii 539, *Becc in Ann Jard Bot Buitenz* ii. 80, 86, *Males* iii 122 Areca hexasticha, *Kurz in Journ As Soc Beng* xliii ii 201, t 12

PEGU, in marshy forests, *Kurz*

Stems 25-30 ft. by 1½ in diam *Leaves* 3-5 ft, sheaths and short petiole scaly, leaflets 1-1½ ft., many, narrow, linear, subfalcate, 2 3-ribbed, lower acuminate,

upper truncate toothed *Spad x* about 1 ft long rach s as thick as ... fleshy flo vers ses le ro s sp rally arranged *F u t narrowed at the t*

2 **P gracilis,** *Blu ie Rumpl* i 77 stems slender ...

Kunth En m i i 191 Areca grac l s *Roxb Fl Ind* ... *Calc Journ Nat Hist* v 460 *P l is Br t Ind* ... (not B) *Kur in Journ As Soc Beng* xl i °01 *T And ... Ii i Soc* xi o Nenga grac lis *Be Males* i 2o A. tranlra, *I Wall Cat* 8o99

SIKKIM and BHOTAN HIMALAYA alt ° 3000 ft *J D H* ASSAM ... HILLS and CHITTAGONG to TENASSERIM *Roxburgh &c*

Ste s 6– 0 ft by ¼ ½ d am th ckene l upwarl *Lea es* 3–4 ft ... sheatl s scurfy leaflets se te l by a very b o d b se 1 ft lon or mo ... r bbed finely ac m nate upper 3 5 l road præ norse many ... sol tary ° fid *Spad x* wl te r c rlet glab ous *Ma e fl* broad flat ... cal x m nute petals broad cusp ately acun at *F u t* ½ n lo ... orange taper ng to tl e t p s nooth

3 **P Griffithii,** *Be c Males* iii 117 stem ? leaves ... leaflets numerous spa lix ped ncled reflexed subd g tately bran ... branches 4 spreading male calyx sl o ter tl an the petals fru ts spars ... disposed in 4 series ovoid narrowed at the mamillate tip Areca ... *in Calc Journ Nat H t* v 461 (*n ler A gracil s* fruit only) *Palms Brit Ind* o5 t °32 (*spad x o ly*)

KHASIA HILLS *Gr ffith*

4 **P polymorpha,** *Becc Males* iii 1°° stem slender leaves sh ... subentire forked or more or le s pinnat fid pet ole very slender ... not grooved spadix slender refracted after flower ng simple or 2–... branches short, fl 3–4 seriate fruit small ell p so d or obovoid suba ... base narrowed

... Perak alt 3 4000 ft *Scortech n* (n 31

2½ 4 in long *Leaves* very variab ... so each s de and a broad flabell... fork d apex pet ole ar so e a (sheath scal *Spathe ell pt c* acute *Spad x* 3– ... long peduncl nearly as long slender *Male fl* acu n nate calyx sho tly 3 to ... stamens 1° *f m fl* globose *Fru t* ¾ by ¼ ½ in t pped by the st gma black ... sh n g (dark yellow *A ngs Collector*) per carp th n *Seed* obovo d albumen densely ru at The fru ts in some spec n ens are ell pso d and narrowed at both e ds g rt w tl a tl ckened r ng at about ¼ of the r length below the t p, from the sl r nk g of tl e per carp

5 **P. robusta,** *Becc* mss, stem taller and much more robust than *P polymorpha*, 15-20 ft high by 1½-2 in diam, leaves 1½-2 ft long, petiole and costa of blade nearly as thick as the little finger, spadix and its branches very stout

MALAY PENINSULA, Perak, on the top of Gunong Booboo, alt 3 5300 ft *King's Collector* (No 7372)

Evidently allied to *P polymorpha*, but the specimens are insufficient for a fuller description

6 **P. Scort...** ... solitary, young inter... narrow, petiole long ...itate, flowers spirally

MALAY PENINSULA, Perak *Scortechini*, alt 3000-4000 ft, *King's Collector*

Stem 6-15 ft ¾ 1¼ in diam *Leaves* 3-4 ft long, sheaths scurfy, leaflets numerous, 1 1½ ft by 1 1⅓ in rather rigid 2-3 ribbed, finely acuminate, base hardly narrowed *Spathe* elliptic oblong *Spadix* stoutly peduncled, depressed ⅔ 1¼ in long with a large triangular deciduous bract branches 2½-4 in long *Male fl* sepals triangular cuspidate petals rather longer acuminate *Sepals of fem fl* cuspidate ciliolate petals rather larger *Fruit* ⅔ in long, black, shining t p rounded or subacute albumen densely ruminate

B ORTHOSTICHANTHEÆ Becc *Flowers* in 2 series on the spadix or its branches

* Leaves entire or sparingly divided

7 **P. disticha,** *Blume (fid H Wendl in Kerch Palm* 253), stem very slender short leaves small cuneately obovate simple and deeply forked or with a few broad lateral leaflets, spadix small simple refracted villous male petals much longer than the calyx fruit ovoid or fusiform acum nate *Becc Males* ... 192 ... *Bull Neerl* 1838, ... Areca disticha, ... v 461 *(partly as to* ... humilis, *Roxb Ic* ... 48 (non *Kotul* in 164) Seaforthia disticha *Mart Hist Nat Palm* 184, *Kunth l c* 190 Ptychosperma disticha *Miq Fl Ind Bat* in 28 et *Suppl* 253 590, *Journ Bot Neerl* 1 7, *De Palm Arec* 24

PENANG *Roxburgh, Curtis* (No 391), Perak alt 100 800 ft. *Herb Calc* (Nos 2536 ; ...)

Stems ...-6 ft by ¼-½ in usually tufted *Leaves* 12 15 in, forked, and many-nerved the nerves ending in setaceous points or with a few unequal acuminate lateral leaflets inserted by a broad base, sheath closely grooved and short petiole scurfy *Spadix* 2-3 in long *Stamens* about 15, pistillode 0 *Fruit* ¼ in long narrowed at both ends but ... *Seed* ovoid, albumen ac... pied by Griffith, t 233) ... 4423 from Perak —The

8 **P. subruminata,** *Becc Males* in 174, stem very slender, leaves cuneately obovate forked, lobes truncate doubly toothed 12-15 nerved petiole long slender, sheath deeply closely grooved, spadix piercing the sheath of the old leaf very short reflexed bipartite glabrous branches flexuous fruit narrowly ovoid or ellipsoid apiculate

MALAY PENINSULA, Perak, alt 100 ft *Herb Calcutt* (No 7797), *King's Collector* (No 1968) PENANG alt 1500-2000 ft, *King's Collector*

Stem 2–6 ft by ⅓ in, internodes 2 2½ in, brown scurfy *Leaves* 9–12 by 4 5½ in, glabrous, petiole 6–10 in, subterete, sheath 4 in, tubular, scurfy, ligule scarious, fimbriate *Spadix* with its stout peduncle ¾ in long, branches sinuous, few-fld *Fruit* about ½ by ¼ in, red *Seed* narrowed at the tip, raphe with 5 branches, albumen very faintly ruminate

** Leaves much divided

† *Spadix large much branched*

9 **P. Manii,** *Becc Males* in 178, trunk tall stout leaves large, ... many strongly 1–3 nerved spadix reflexed stoutly peduncled, ... about as long as the petals, fruit ... subglobose Areca costata, *Kurz in* ... *all synons*

... ruminate

10 **P. Kuhlii,** *Blume in Bull Neerl* 1838, 65, *Rumph* ii. 82, t 111 et β t. 111, f 11–13, stems tufted slender leaves pinnate, leaflets many falcate linear to linear lanceolate finely acuminate strongly 2–3 ribbed upper confluent, petiole subscurfy, spadix refracted shortly peduncled robust simply branched glabrous branches elongate, fruit obovoid or ellipsoid shortly apiculate *Kunth Enum* iii 641, *Miq Pl Jungh* 57, *Scheff in Natuurk Tijdsch Nel Ind* xxxii 182, *in Ann Jard Bot Buitenz* i 152, *I* ... *Rumphia l c* 8(... *For Fl* ii 538 ... 313 S oryzæformis ... *Kunth l c* 191 S costata *Mart l c* 313 Ptychosperma Kuhlii, *Miq Fl Ind Bat* iii 21, *De Palm Archip Ind* 23 P costata, *Miq ll cc* 25, 23 Areca oryzæformis, *Gærtn Fruct* i 20, t 7, f 2, 6 (*not of Rumph*)

SOUTH ANDAMAN ISLANDS *Kurz* —DISTRIB Sumatra, Java

Stem soboliferous 20 30 ft (Kurz), (10 ft Becc) *Leaves* 3–4 ft, leaflets 1 2 ft, petiole variable in length *Spadix* 1 ft *Fruit* nearly ½ in long *Seed* adherent to the pericarp, albumen deeply ruminate —The above is ch... from Kurz's *P costata* in For Fl It may be the *P coronata* mentioned by Kurz in his Andaman Report as abundant in the South Andaman Islands

†† *Spadix with few distichous branches*

P. D... trunk solitary tall ...

WESTERN GHATS, on the Nilghiri and Travancore hills, alt. 2500 ft.
Trunk 16–18 ft by about 2 in diam *Leaves* 4 ft, forked, leaflets sessile,

Ind Bat in 26 and Suppl 253, in *Journ. Bot. Néerl.* i. 7, *De Palm Archip Ind* 23, stems tufted slender 6–7 ft high ½–1 in diam, leaflets few, rarely many, broad, distant sigmoidly lanceolate and falcate from a narrowed base caudate-acuminate 2 many nerved terminal broader 7–9 nerved truncate and deeply doubly toothed, spadix refracted branches 2–5, fruit elliptic ovoid, narrowed and acute at the tip about ⅓–¾ in long ¼–⅓ diam —Perak, on Ulu Bubong, *King's Collector* 10702) Sumatra Borneo —The above description is chiefly from Sumatran specimens The Perak have internodes 2½–3½ in long, ⅗ in diam, covered with white scurf, a 4-branched spadix and the leaves minutely puberulous beneath A very similar plant collected by Helfer in Burma (n 6427) without flowers, in fruit, has broader leaflets with the nerves puberulous beneath

3 NENGA, *H Wendl & Drude*

Characters of *Pinanga*, but sepals and petals subequal, subulate, and ovule parietal —Species few, Malayan

1 **N. Wendlandiana,** *Scheff in Ann Jard Bot Buitenz* i 153 (*partly*), t 9–10, leaves pinnate, leaflets alternate ensiform finely acuminate, spadix about 4 branched, flowers tetrastichous, male sepals subulate rather longer than the petals, fruit ovoid mamillate stigma conical, seed ovoid acute *Becc Males* i 25, in *Ann Jard Buitenz* ii 83 N. pumila, *Wendl in Kerchov Palm* 251 Pinanga Nenga *Blume Rumphia*, ii 77, t 107 (*excl var pachystachya*) Areca Nenga *Blume in Mart Hist Nat Palm* iii 179 *Scheff in Natuurk Tijdsch Ned Ind* xxxii 166 (*excl var γ*) Areca pumila *Blume in Mart l c* 177, t 153 f 1–3, *Miq Fl Ind Bat* iii 14 (*excl var γ*), *De Palm Arch Ind* 23

Var *malaccensis*, Becc Males iii 182, petiole very short, fruit broadly ovoid about 1 in long, seed broadly truncate at the base cuspidate and spinous at the tip. Areca (Axanthasmus) pumila, *Griff in Calc Journ Nat Hist* v 456; *Palms of Brit Ind* 151

Var *malaccensis* Ching forest Malacca, *Griffith* PERAK, Larut, *King's Collector* (4022) —DISTRIB (of the species) Sumatra Java

Stem 10–20 ft by 2 3 in diam *Leaves* 8 9 ft pinnate nearly to the base, leaflets alternate 2½ ft by ½ 1½ in broad caudate acuminate bright green, coriaceous, 2 ribbed, petiole as thick as the little finger sheaths 2 ft long, subventricose *Spathe* about 2 ft *Spadix*, peduncle 1½ in, branches 6–12 in, level-topped, pendulous fruiting very thick, flowers about 4-ranked yellowish white *Male fl* sepals ⅓–½ in long triangular-subulate, finely acuminate, petals ovate-oblong, cuspidate stamens 6, pistillode 0 *Fem fl* sepals and petals roundish, staminodes 0 *Fruit* 1 in by nearly ½ in broad, orange-colrd —An abnormal form in which the male fl has 3 sepals, and 6 petals 2 rows (var *malaccensis hexapetala*, Becc Males iii 183) was found at Perak by *Scortechini*

2 **N. macrocarpa,** *Scortech mss ex Becc Males* iii 180, leaves pinnate leaflets sigmoidly falcate, spadix 3–4 branched, flowers hexastichous, male sepals subulate hardly longer than the petals, fruit elongate ellipsoid, crowned by the large deeply 3-lobed stigma, seed broadly ovoid abruptly spinescent

PERAK, on Maxwell hill alt 3200 5300 ft, *Scortechini* (No 517ᵃ, 302ᵇ), Goping *King's Collector* (4770) on Gunong Batu Pateh, *Wray* (930)

Stem solitary, 6–10 ft *Leaves* 3–4 ft, leaflets 18–30 pairs, rigid, acuminate, lower narrow 1 nerved, 16–20 by 1 1½ in upper longer broader and 2 nerved, petiole 4 12 in, sheath as long smooth or subscaly *Spathe* glabrous, purplish *Spadix* at first erect, then spreading, peduncle short, stout, branches 7–12 in *Male fl* stamens 6, pistillode of 3 tubercles *Fem fl* sepals cibolate and petals orbicular;

stam nodes 6 m nute teeth *Fruit* about 1½ in long by ½ in d am ell p o d st gmas 3 broad triangular

4 LOXOCOCCUS, *H Wendl & Drude*

Stem erect annulate *Leaves* pinnatisect leaflets obliquely truncate *Spadix* infrafoliar branched spathes 2 flowers 3 together (a fem between 2 males) clusters spirally arranged *Male fl* Sepals 3 rounded imbricate petals 3 much larger ovate valvate stamens 9 12 filaments very short anthers subve
broadly imbricate
1 celled stigmas 3
beaked stigmas term

L rupicola, *H Wendl & Drude* in *Linnæa* xxxix 185 *Hook f Bot Mag* t 6358 Ptychosperma rupicola *Thw En* 328 Caryota mitis *Willd ? Moon Cat Ceyl Pl* 64

CEYLON in forests of the Southern and Central Provinces

Trunk 30 40 ft by 4 5 in diam *Leaves* 6–8 ft spreading leaflets 1? ?0 pairs 2 ft by ?½ in spreading linear subula cous beneath and sparsely furfuraceous petiole 1 ft sheath very short *Spathe* 1 ft pale yellow *Spadix* 1 ft blood red sublelto d peduncle short and branches stout spreading q te glabrous flowers in scattered clusters of 3 *Male* ½ in d a filaments out equ ll u the anthers p st llode minute 3 fid at the t p *Fruit* about 1 in long globosely ovoid *Seed* globose

5 PTYCHORAPHIS, *Becc*

Stem slender annulate *Leaves* pinnatisect leaflets narrow caudate acuminate *Spathes* 2 complet caducous *Spadix* infrafoliar paniculately branched flowers spirally d sposed male only towards the tips of the branches a fem between 2 males towards the base *Male fl* symmetric sepals suborbicular petals valvate stamens 6 anthers versatile pistillode conical or columnar *Fem fl* bracteolate sepals rounded concave petals longer tips valvate staminodes 4–6 ovary ovoid stigmas 3 triangular acute ovule parietal *Fruit* small ovoid stigmas terminal *Seed* ovoid obtuse deeply grooved along the long linear hilum albumen deeply ruminate embryo basilar oblong —Species 3 Malayan

1 P singaporensis, [illegible]

SINGAPORE *Maingay* (*Kew Dist* 1536) JOHORE on Gunong Pulai *Hullett* (6000) *Kunstler* (?30)

Stem 6–1? ft by 1½ in diam obol ferous *Leaves* 3–6 ft regularly p n

Stem 2-4 ft by ½ in, annulate *Leaves* 3-3½ by 1-1½ ft., linear-oblong; leaflets linear, 1 ft by ½-2 in, 2 or more-keeled, terminal forked, lobes erose dentate, *petiole* 1 ft, base scurfily pubescent; sheath a span long *Spathes* subcoriaceous, lowest 2-keeled, upper conduplicate and spadix brown pubescent *Spadix* with a long slender erect peduncle, and 2 or more pendulous spongy spikes or branches 6-10 in long, loosely covered with flowers, fruiting 1-1½ ft nodding, flowers inserted in pits with membranous margins *Male fl.* in pairs, sepals oblong, striate, petals ovate lanceolate, filaments inflexed in bud, pistillode stout, tip 3-lobed. *Fem fl* towards the base of the spike, sepals of the male, petals broad, ovary gibbous *Fruit* over ½ in long by ⅓ diam, black purple *Seed* erect, albumen ruminate.

2 **I. malaccensis,** *Becc Males* iii 102, stem slender, leaves pinnate, leaflets about 5 pairs lower falcate caudate-acuminate upper broader, petiole pubescent, spadix simple filiform, finely tomentose

MALAY PENINSULA, Selangore, *F Keheding*, Perak, Larut, *King's Collector* (1869, 2994)

Closely allied to *I geonomæformis*, differing in the fewer leaflets and simple not furfuraceous but finely tomentose spadix

** *Spadix interfoliar, long peduncled, with few subterminal short simple or forked branches or spikes*

3 **I. Wallichiana,** *Hook f in Gen. Plant* iii 908, leaves simple or pinnatisect, fruit globosely obovoid Areca Wallichiana, *Mart. in Wall. Cat* 8600, *Hist Nat Palm* iii 178, 312, *Becc Males* iii 100

PENANG, *Porter* SINGAPORE, *Lobb*

Stem solitary, 2-12 ft, straight, slender *Leaves* very variable in size, 10 in-2 ft long, simple and forked or more or less pinnatisect, with long narrow leaflets *Spathes* 2, lower 2½ in, hidden in the leaf sheath, strongly compressed, acutely 2 keeled, *tip* 2-toothed, upper shorter, acuminate, rusty-pubescent *Spadix* long-peduncled, peduncle 18-24 in, branches 3-7 variable in length *Fruit* rather more than ⅓ in long by ¼-⅓ in diam, red when ripe — The following varieties are from Perak —

Var *α major*, Becc stem 10-12 ft by 2½-3½ in diam, leaves 2-4 ft undivided or pinnatisect, fruit about $\frac{7}{10}$ by $\frac{2}{5}$, —*King's Collector* (431, 8227, 3127).

Var *β minor*, Becc stem 18-30 in, leaves about as long simple or pinnatisect, fruit rather smaller —*King's Collector* (454, 7941, 7996, 7999)

*** *Spadix interfoliar, very shortly peduncled.*

4 **I. brevipes,** *Hook f*, leaves pinnate, leaflets distant broadly trapezoidly cuneate or subquadrate præmorse many nerved coarsely toothed, spathe long deeply grooved, spadix laxly paniculate, branches divaricate lax fid

PERAK, Larut 3-4000 ft, *King's Collector* (2029)

Stem thicker than a swan's quill *Leaf* 15 in, leaflets 5 pairs, 5-6 in long by 1½-3 broad, inserted by a contracted but very broad base, upper margin subcaudate, rachis glabrous, sheath 5 in, many-ribbed *Spadix* with the peduncle wholly included in the leaf sheath, quite glabrous; primary branches 3-4 3-4 in long, sparingly again divided, rather slender, angled (*when dry*) *Male fl* scattered, about $\frac{1}{12}$ in long, sepals orbicular, petals broadly oblong, obtuse, very coriaceous; stamens 6, filaments inflexed, anthers linear oblong, pistillode columnar, capitate

**** *Spadix infrafoliar, peduncle shorter than the spathe or shortly exceeding it*

5 **I. diffusa,** *Becc mss.*, leaves large, leaflets numerous equidistant

narrow, spadix with 8–10 very spreading slender branches of which the lower are twice or thrice forked, peduncle closely embraced by the spathe.

PERAK, on Gunong Tjoh, *Scortechini*

One of the largest of the genus *Leaves* about 3–4 ft, leaflets very numerous, alternate and opposite, 12 15 in by 1–1½ in, obliquely præmorse, rachis glabrous. *Spadix* about 20 in, including the 10 in peduncle which is closely sheathed by the persistent spathe, branches 6 10 in, filiform, divaricate —The specimen which is very imperfect may be a luxuriant state of *I polymorpha*

6 **I. polymorpha,** *Becc Males* in 189, leaves pinnatisect, leaflets trapezoid subfalcate præmorse, spadix erect, peduncle sheathed by both the spathes with 3 9 simple branches at the apex, fruit ovoid or elongate conic straight or curved

PERAK, *Scortechini*

Stem 3–7 ft *Leaves* oblong, 14 16 by 8 10 in, leaflets 10 14 on each side, obliquely præmorse and toothed, 4–5-nerved *Spadices* often two, 12 20 in long, erecto patent, branches filiform, angular, peduncle 5 6 in, slightly compressed

Var *typica*, spadix with 3 9 branches, flowers spirally disposed, male oblong subacute, fruit ⅖ ¾ in by ⅓ in diam, others ½ by ⅓ in, ovoid or elliptic-ovoid — *Scortechini* (318b)

Var *canina*, Becc l c 190, spadix with 7 9 branches, flowers alternate subdistichous, male ovoid acute, fem petals twice as long as the sepals, fruit ⅗ by ¼ in elongate conical curved

7. **I. corniculata,** *Becc Males* in 187, leaves pinnatisect, leaflets all similar cuneately trapezoid 3–5 nerved, tip very obliquely præmorse toothed, base constricted, spadix slender undivided, peduncle closely embraced by the very slender tubular spathe, spike furfuraceous, fruit narrow elongate conical tip incurved or involute

PERAK, alt 3 400 ft, *Kunstler* (3131)

Stem very slender, 3 4 ft, by ¼ in diam or less, internodes ¾–1½ in *Leaves* 10 12 by 6 8 in, leaflets 5 6 spreading like a butterfly s wings 3½–4 by 1–1½ in, upper margin produced into a tail, 3 4 nerved, furfuraceous beneath along the folds, petiole slender 3 1½ in, rustily furfuraceous, as is the sheath *Spadix* about a foot long, including the peduncle of 3 4 in, spike rusty scurfy, flowers sub-spirally disposed, males very small *Fruit* granulate, ⅔–¾ by ⅙ in —The fruit is in shape unique in the order

8 **I. parvula,** *Becc mss*, leaves small oblong tip forked margin undulate, spadix filiform sparingly branched, peduncle about as long as the petiole more than half embraced by the spathes

PERAK, *Scortechini*

Stem ⅛–⅙ in diam *Leaves* 8–10 by 3 in, petiole 2 2½ in —Described from a single specimen. Possibly a very small form of *I polymorpha*

9 **I. bicornis,** *Becc Males* in 188, leaves pinnatisect, leaflets sigmoidly trapezoid, spathes deciduous, spadix erecto patent very shortly peduncled, branches 5–8 slender diffuse, fruit oblong base narrowed tipped by 2 obtuse unequal bosses

MALAY PENINSULA, Perak, *Scortechini* (n 1188), at Larut, alt. 12 1300 ft; *King's Collector* (6375), alt 3 4000 ft

Stems tufted 5 8 ft by ¼ in diam; internodes ½–1½ in. *Leaves* 12–16 by 4–6 in, leaflets 2–4 pairs, with a deeply bifid terminal, petiole 3–4 in, glabrous,

sheath as long, tubular, mouth truncate. *Spadix* 4–8 in., peduncle ½–1½ in., branches 3–6 in., scattered, filiform; flowers minute. *Fruit* ½ by ⅓ in.

9. BENTINCKIA, *Berry.*

Unarmed Palms. *Leaves* terminal, equally pinnatisect. *Spathes* many, 2 lower short incomplete, upper 2-fid. *Spadix* interfoliar, branched; flowers minute, monœcious or polygamous, solitary or 3-nate with the intermediate female, clustered in spirally arranged pits on the branches; bracts forming a 2-lipped mouth to each pit, bracteoles 2. *Male fl.* subsymmetric, glumaceous, often reduced to ciliate scales; sepals oblong, obtuse, connate below, imbricate, petals longer, connate below into a stipes, valvate, stamens 6, anthers versatile, pistillode conical. *Fem. fl.* ovoid; sepals broad, obtuse, imbricate, petals longer, convolute; staminodes 6, minute. *Ovary* 3-celled, 1-ovuled, stigmas minute. *Fruit* small, subspherical, stigmas subbasilar. *Seed* pendulous from the top of the cavity, sinuately grooved or ridged, albumen equable.—Species 2.

1. **B. Coddapanna,** *Berry, in Roxb. Fl. Ind.* iii. 621; stem slender 10–20 ft., fruit subspherical. *Mart. Hist. Nat. Palm.* iii. 165, 228, t. 139; *Kunth Enum.* iii. 228; *Griff. in Calc. Journ. Nat. Hist.* v. 467, *Palms Brit. Ind.* 160, *Append.* xxvi.; *Wight in Madr. Journ. Nat. Sc.* ii. 385. Keppleria, *Mart. mss. ex Endl. Gen. Pl.* 25.

TRAVANCORE, *Wight,* &c.

A slender palm, stem 1 in. diam. or more, annulate. *Leaves* 3–4 ft., leaflets 2 ft. or more by 1 in. broad, close together, linear, 2-keeled, keels paleaceous, tip usually 2-fid, lobes 2–4 in. triangular. *Spathes* membranous, lower truncate, upper complete. *Spadix* 1–2 ft., male scarlet, fem. blue or violet, peduncle 2–3 in.; branches few, again branched, ultimate 6–10 in., bract at the base broad; pits on the branches 3–4-fid, flowers emerging and opening singly, the upper first. *Fruit* rather compressed, about ½ in. diam.

2. **B. nicobarica,** *Becc. in Ann. Jard. Bot. Buitenz.* ii. 165; trunk tall 60–70 ft., fruit obovoidly oblong tip rounded. Orania nicobarica, *Kurz in Journ. Bot.* xiii. (1875) 331, t. 171, f. 19–25.

NICOBAR ISLANDS, Kamorta, *Kurz, E. H. Man.*

Trunk annulate, 9 in. diam. *Leaves* 5–8 ft., leaflets ½–2 ft., sessile, linear, coriaceous, tip obtusely 2-lobed, petiole short and rachis glabrous. *Spadix* 1½–2 ft., decompound glabrous, branches and branchlets inserted in woolly grooves of the rachis, bracteoles densely villous within. *Fem. fl.*, sepals and petals subsimilar, broadly ovate, obtuse, shining. *Fruits* tristichously arranged, globose (sub-ovoid when dry), the size of a cherry. *Seed* ovoid-oblong, ventrally flat, dorsally convex rugosely ribbed, albumen equable, embryo lateral and apical.

10. WALLICHIA, *Roxb.*

Soboliferous palms. Leaves pinnatisect, leaflets linear or oblong, irregularly toothed, base cuneate, unicostate, nerves flabellate. *Spathes* very many, tubular, clothing the peduncle of the spadix, upper large cymbiform. *Spadices* interfoliar, monœcious or polygamous, males ovoid, excessively branched and dense-fld., fem. looser-fld. *Male fl.* symmetric; calyx cylindric or cupular, membranous, truncate; corolla cylindric, deeply 3-lobed, lobes oblong, valvate, stamens 6, on the corolla-tube; filaments short, anthers large; pistillode 0. *Fem. fl.* much smaller, subglobose;

1 **W. densiflora,** *Mart Hist Nat Palm* ii 190 & *Suppl* 315, leaflets oblong or linear oblong sinuately lobed acutely toothed white beneath, fem fl crowded 2 bracteate male corolla twice as long as the calyx, ... corolla shorter than the ovary ... *Mart* t 181 ... *Palms Brit Ind* 175, t 237 A, B, C.

TROPICAL HIMALAYA from Kumaon eastwards ascending to 3000 ft ASSAM, the KHASIA HILLS, and CHITTAGONG

Stems very short or 0 (or often 5-15 ft Kurz), trunk sheaths ... villous, resolving into strong fibres *Leaves* 8-10 ft leaflets 1-2 ft very many, alternate or the lower 2-4 nate ... and with many parallel nerves, green above, sheaths scurfy *Spathes* purple *Spadices* 12-18 in long branches of fem very stout flowers in many spiral series ... yellow ... lower in pairs with an intermediate fem ... filaments ... to the petals, fem fl purplish, calyx very short corolla lobes obtuse *Fruit* about ½ in long, dull purple

2 **W. caryotoides,** *Roxb Cor Pl* iii t 295 leaflets oblong or linear oblong panduriformly excised and acutely toothed white ...

Harina caryotoides ... *Griff Palms Brit Ind* 174, t 237 *Wrightia caryotoides*, *Roxb Hort Beng* 63, *Fl Ind* iii 621

CHITTAGONG and BURMA in hill forests ...

Habit of *W. densiflora* and very similar ... but differing in the characters given above and in the fruit which Kurz describes as being as large as a nutmeg ovoid oblong ... 2 seeded —(Roxburgh says as large as a coffee bean)

3 **W. disticha,** *T Anders in Journ Linn Soc* xi 6 trunk tall stout, leaves distichous leaflets fascicled linear narrowed to the base praemorse denticulate, male calyx cupular 3 lobed, corolla thrice as long, fem corolla longer than the ovary *W Yomae Kurz For Fl* ii 533, Caryota mitis, *Herb Calcutt*

SIKKIM HIMALAYA in tropical gorges, *T Anderson* and probably eastwards. PEGU, *Kurz*

Trunk 10-15 ft by 5-6 in diam, naked, annulate *Leaves* 6-10 ft, alternat-

11 DIDYMOSPERMA, *H Wendl & Drude*

Small low palms *Leaves* terminal, unequally pinnatisect; leaflets few, trapezoid, erose, uni costate, nerves flabellate *Spathes* many, sheathing the peduncle of the spadix *Spadix* interfoliar, stout and simple, or slender and *branched*, *monœcious or ?diœcious*, flowers rather large *Male fl* symmetric calyx cupular, 3-fid, imbricate, petals coriaceous valvate, stamens 10 30, anthers linear, erect, pistillode 0 *Fem fl* subglobose, sepals rounded, coriaceous, petals thick, triangular, incurved, valvate, staminodes 0 *Ovary* depressed 3-gonous, 2-3 celled stigmas conical, ovules basilar *Fruit* ovoid or oblong, 1-2 celled and -seeded, stigmas terminal *Seeds* erect oblong, plano convex, albumen equable, embryo dorsal —Species 6 Malayan and Indian

1 **D. Hookeriana**, *Becc Males* m 186 stem slender, leaves small long petioled white beneath, some oblong from a cuneate base, some entire or lobed, others pinnatisect with *obovate* oblong or trapezoid long-tailed leaflets shortly ansate at the base, spadix filiform

MALAY PENINSULA, Perak, *Scortechini*, No 229b 1365) *King's Collector* (n 2446)

Stem 3-4 ft, solitary or tufted, ⅓-½ in diam *Leaves* extremely variable, 12-30 in long, petiole slender, sheath furfuraceous *Spadices* about 8 in long, sheathed with 5-6 spathes, flowers spirally disposed in clusters of 3, *male fl* oblong, sub clavate top rounded *Fruit* unripe, globose

2 **D. hastata**, *Becc Males*. m 99, stem slender leaf sheaths scurfily hispid, leaflets 6-7 terminal trapezoid, lateral petiolulate trapezoid caudate acuminate, base hastate and ansate, spadices filiform nodding

MALACCA at Selangore *F Keheding* PERAK Larut *King's Collector* (3125)

Stem 3 ft, solitary or sparingly tufted *Leaves* 1½-2 ft, terminal leaflet 4½-6 in by 1-2 in, lateral rather longer and broader lower margin straight anterior sinuate toothed *Spadix* 1 ft long, *male fl* ⅛ in —*Habit*, &c, of *D Hookeriana*, but the leaf sheaths are brown scurfy as are the leaflets more or less beneath, and the latter have broadly cuneate more or *less* ansate bases petiolule 1 in and more

3 **D. nana**, *H Wendl & Drude in Kerchov Palm* 243, leaves pinnatisect leaflets about 5, terminal flabelliform lateral opposite obliquely trapeziformly lanceolate acuminate not caudate irregularly lobed and toothed, pale beneath, spadices erect very stout simple or sparingly branched rustily scurfy dense fld *Hook f B t Mag* t 6836 Wallichia nana, *Griff in Calc Journ Nat Hist* v 488 *Mart Hist Nat Palm* 190, t 31 *Mig Fl Ind Bat* m 34 Harina nana, *Griff Palms Brit Ind* 176, t 238 A B

ASSAM and the KHASIA HILLS, ascending to 4000 ft

Stem 3-5 ft clothed with rusty leaf sheaths petioles and spathes *Leaves* 18 in -2 ft; leaflets 1 3 pairs terminal flabellate variously lobed lateral 7-10 by 3 5 in, also variously lobed *Fem fl* ¼ in diam *Fruit* ¾ in long, oblong white

4 **D. gracilis**, *Hook f*, stem very slender leafy upwards, leaflets 6-8 lateral broadly cuneate below the middle above it triangular or 3-lobed or truncate and acutely toothed, fem spadix slender erect 3 branched, fruit elongate ovoid obtuse base rounded, seed elliptic oblong concavo convex

ASSAM, Daphla hills, *Booth*
Stem 2 ft, about as thick as a duck's quill. *Leaves* 8–18 in, rachis and petiole

collector in Assam

12 ARENGA, *Labill.*

peduncle short decurved, branches slender pendulous, male and fem flowers usually solitary and in separate spadices rarely 3-nate a fem between 2 males *Male fl* symmetric, sepals orbicular, imbricate, petals oblong valvate, stamens numerous, filaments short, anthers apiculate, pistillode 0 *Fem fl* subglobose, sepals accrescent, petals triangular, valvate, staminodes many or 0, ovary subglobose, 3 celled, stigmas conic *Fruit* obovoidly globose, 2 3 seeded, stigmas terminal *Seeds* compressed or plano-convex, albumen equable, embryo dorsal —Species about 10, trop. Asia, Malaya and Australia

1 **A. saccharifera,** *Labill in Mem Inst Fr* iv 209, trunk tall toothed *Mart* iii 35, *Palms Kerchov* charifer, 123–4.
Gomutus saccharifer, *Spreng Syst* ii 622 Borassus Gomutus, *Lour Fl Cochinch* ii 759

ASSAM, PEGU, BURMA, and the MALAY PENINSULA —DISTRIB E. Asia and Malaya.
Trunk 20–40 ft *Leaves* very many 20–28 ft, leaflets up to 115 on each side, 3 5 ft long, subsessile, linear, coriaceous, costa stout scurfy beneath, petiole scurfy. *Male spadix* 4–5 ft, simply branched, flowers oblong clavate purple 1 in long and less *Fem fl* solitary, 1 in diam *Fruit* 2 2½ in long, oblong turbinate, base narrowed, top rounded or depressed

2 **A. obtusifolia,** *Mart Hist Nat Palm* 191, t 147, 148, 161, trunk tall very stout, leaflets bifarious linear narrowed and truncate 2 lobed or toothed at the tip white beneath, base 1- or ex-auricled, male buds acute *Miq Fl Ind Bat* iii 36 A Westerhoutii, *Griff in Calc Journ Nat Hist* v 474, *Palms Brit Ind* 166, t 235 B, C, D, *Mart l c* 192, *Miq l c* 37 Saguerus Langkab, *Blume Rumph* ii 131, t 96, 125. Gomutus obtusifolius, *Blume m s*

PENANG, *Lewis* MALAY PENINSULA at Naning, *Westerhout*
Very nearly allied to *A saccharifera*, distinguished by the arrangement of the leaflets, which according to Griffith are bifarious with deflexed tips, the upper alone

a r cle l and only on one s le the ac te male b ids an l by the ol long fru t narrowed at both ends

3 **A Wightii,** *Griff in Calc Journ Nat Hist* v 475 *Palms Brit Ind* 167 t 230 F trunk short stout soboliferous leaflets alternate crowded linear ? a ir cled at the base tip narrowed unequally 2 lobed and toothed white beneath male buds acute

The DECCAN PENINSULA Coimbatore *Wight* Nilghiri hills alt 3000 ft *Gamble*

T nk 3 8 ft *Leaves* 1? 8 ft leaflets l near ens form 3 3½ ft by 1¼ ? in marg ns par ely tooth l fro n the m ddl up ? l *lo er* aur cle very large over lapp ng th p t ole p t ole 6-8 ft *Spad ces* 4 ft ped ncle 2 ft *Fruit* about the ze of a crab-apple globos ly turb nate broad th n l g

13 CARYOTA, *L*

Tall palms soboliferous or not flowering from the upper leaf sheaths and successively from lower (alternately male nd fem) trunk naked or sheathed *Leaves* f w very large broad b p nnatisect leaflets very obliquely dimidiately flabelliform or cuneiform pr*emorse* or rounded at the tip petiol les or ba es swollen at the insert on *Sp thes* 3 5 incomplete tubular *Sp d* interfol ar shortly pe luncled much fastig ately bran hed branches slender pendulous flowers sol tary and male or 3 nate with the intermed ate fem *Fe t fl* symmetric sepals rounded imbricate petals linear oblong valvate *stamens very many* filaments very short, anthers long *Fem fl* subglobose sepals rounded imbricate, petals rounded valvate ovary 3 celled stigma 3 lobed ovules erect *Fr t* globose 1 2 seeded stigma terminal *Seed* erect albumen rumi nate embryo dorsal Species about 10 tropical Asiatic Malayan and Australian

1 **C urens,** *L* *Fl Zeyl* 187 trunk stout tall *not* soboliferous leaflets cuneiform v ry obl quely truncate ac tely ser ate toothed upper margin prod iced and c ud te male buds cyl n lr c abo it 3 times as long as broad stamens ? ? fruit ? ? n diam base pedicel te testa adherent *Corta f el ? ? t ? R xb Fl I l* iii ? *? ? Hist Nat* 1 *Im* 1?3 t 107 and 108 and 1?2 *Griff* ? *C* ? *J rn ? ? Hist* v 4?9 *? ? Ind* 160 *Th* ? ? ? *D* ? & ? *Bo* ? *Fl* ?8 *Mq Fl Ind Bat* iii ?1 —*Phoenix Hort Mal* ? t 11

Thro gho it the HOTTER PARTS OF INDIA fr m the S kk m Himalaya and Assam so th wards to C ylo ? ? pore—D str b Trop ? Malaya

Tr nk 30-40 ft ? ? ? ? an late *Leaves* 18 ?0 b 10-1? ft leaflets ? ? ? ? ? ? ? ? ? ? ? 4 8 ? ? ? ? ? ? outer ? ? ? ? ? ? p t ole ? ry sto t ? ? 10 12 ft ? g ? ? ? ? 1½ ft bra ch es all reach ng th sa ne level flowers ? ? ? ? betwee two ? als male ½ in long or ore *Fr* ? red ? ?

2 **C obtusa,** *Griff in Calc Jo r Nat Hist* v 480 *P l ? Brit Ind* 170 glabrous trunk tall *stout* not soboliferous leaflets very obliquely cuneiform crenate upper m rg n not caudate male b ? ls about as long as broad stamens very many fruit ? ? in diam base not apic late *Mart Hist Nat Pal* iii ? ? *C* obtus lentata *Griff Palms Brit I* t 23 ? B

UPPER ASSAM; Mishmi Mts alt 3 4000 ft *Griffith*

Hab t and stat e of *C ren* f on vl c t ffe s n tle more ro nle l anl crenate apex of tl e leaflets in the sl or er unexp led mal flo vers and sl ghtly in the fru t

Var *æquator al s* Becc m s p nnules mo e acute mo e leeply crenate or serrate male fl l r er stamens nore tl 100 ? C oc l ud *H nce in Jo rn Bot* 18 9 1 4—Mal y I n n ula P r k *W a* (n 1939) M lay Island Cl na

3 **C mitis,** *Lo Fl Coch el* 1 569 stem low sobol fero is pet oles leaf sl eaths and spatl es scurfily villous leaflets very obl quely cune form erose and toothe l pper marg n ac te sp d x branches scurfy male buds cyl ndr c stamens about 15 25 *Mart H t Nat I aln* 1 195 *K ith En* i i C sobol fera *Wall Cat* 8994 *Mart l c* n 194 t 107 f 2 *Gr ff i Cal J rn* *H t* v 181 *Palns Br t Ind* 171 t 236 C *Miq Fl Inl Bat* m 41 *K F Il* 1 530 C ur s *Jacq Fragm* 0 t 1 f 1 C nan *W ll C t* 859 C f rfurace *Bl me in Mart l c* 19 *R mpl a* 1 111 (e l ca l lata) C pro pinqua *Bl me i Mart l c* 195 *J unpl a l* 1 8 t 159 (p l) 16 C Griffith *Be c in Nuo C r B t I l* 1 15

BURMA fro n Arracan so tl rds anl tl e MALAY PENINSULA PENANG anl tl e A d nan Isl n ls —D strib M l y I l nd

St m 15 25 ft by 4 5 n d *Lea* 1 0 ft p es 4 n rregul rly toothed *Spad x* as *C ren* but n h n l r t f er u eq l sc ty l ranches and much small r flo v tl n les al o t l g *Stame* n c l t *Sta ninodes* 3 t ps gla l lar *l t* d n bl l t l h k *Se l* globose testa loose

14 ORANIA, *Z pp l*

Tall stout unarmed palms *I e* ter n nal equally and regularly pinnat sect leaflets l ear t s ol que y lobe l or torn strongly uni costate petiole st ut she tl l ort *l tle* lower short t ib lar cor pressed ppe large cla ate l ft lon t l ally *Sp d x* interfol ar elongate shortly ped n l d b i cl es sle le t st at flowers m nute u pper or all m le lower or ll n te a t l et e n males *Mal fl* subsymmetr c caly n t o hd petal obl n or lar ceolat valvate stame s or 6 fla nents sub late tl e er ct l ts extrors pist llode con e *Fe fl* larg r ovoi l aly men lrano 3 fil petals ovate obt se valvate stam nodes 3 or (ovary go ous 3 celle l stigmas rec rve l ovules pe d lous *F t* glol o e l 3 celled st gmas l asilar *Seel* globose testa spongy adl ere t to tl e endo rp albumen equabl embryo lorsal —Species abo it trop cal Asiat c a l Mala an

1 **O macrocladus,** *M t H t N t Palm* 1 186 t 1 f 1 flowers all 3 n ite a fem bet veen m les m re or le s d t cl ously arrangel stamens (*Be c* *A n J l B t F te* 1 1 164 t 15 Macro clad s sylv cola *Gr ff* i C *le J r* *N t H st* v 1 9 *I alms Br t Inl* 177 t 239 A B

MALAY PE INSULA Mal cca n tle C r t C *ff h* —D TRIB Java

Trunk 40 ft cro l n el l t s ll p l ere *I a es* 1 15 ft subovate in outl ne leafl ts 1–3 ft b n nl te nn l se fv bene th p t ole 5 ft *Spa les* s l spal x s rfy *Spa l x* panc l t ly bran l d no ll g branches s end r flowers l te *Fr* t 1½ 1 s ootl l l

15 NIPA, *Wurmb*

A prostrate æstuarial gregarious palm, stem (or rootstock) branched *Leaves* pinnatisect, leaflets lanceolate, plicate *Spathes* many, sheathing *Spadix* terminal, branched, erect, fruiting drooping, flowers monœcious, male in catkin like lateral branches of the spadix, female in a globose

1 celled 1-seeded carpels with pyramidal tips and infra apical stigmas, pericarp fleshy and fibrous endocarp spongy and flowery *Seed* erect, grooved on one side, testa coriaceous viscid within, and adherent to the endocarp, hilum broad, albumen equable, hollow, embryo basilar, obconic

1 **N. fruticans,** *Wurmb in Verh Bat Genoots* i 349, *ex Blume Rumph* ii 72, iii 164, 165, *Mart Hist Nat Palm* iii 305, t 208, *Lam Illustr* t 897, *Labill in Mem Mus Par* v t 21 22 *Gaud Voy Bonite*, t 67, *Kunth Enum* iii 110, 589, *Miq Fl Ind Bat* iii 150, *Griff Notul* iii 168, *Ic Pl Asiat* 244 *Roxb Fl Ind* iii 650, *Thw Enum* 327, *Kurz For Fl* ii 541

From the SUNDERBUNDS southwards to the MALAY PENINSULA CEYLON — DISTRIB Malay Archip and Australia

Trunk or rootstock very stout *Leaves* 15–30 ft, leaflets 4 5 ft rigid, glaucous beneath, petiole 4 5 ft, very stout *Spadix* 4–7 ft, peduncle 3–4 ft *Fruit* as large as a man's head, carpels 4–6 in long, smooth, brown —Not recorded as existing in either coast of the Deccan Peninsula

16. PHŒNIX, *Linn*

Low or tall diœcious palms *Leaves* pinnate, leaflets lanceolate or ensiform, sides induplicate *Spadices* usually several, interfoliar, erect or drooping in fruit, branched, spathe basilar, complete, coriaceous flowers small, yellowish, coriaceous *Male fl*, calyx cupular 3-toothed, petals 3, obliquely ovate, valvate, stamens 6 (3–9) filaments subulate, anthers erect, dorsifixed, pistillode minute or 0 *Fem fl* globose, calyx of the male, accrescent, petals rounded, imbricate, staminodes 6, or a 6 toothed cup, carpels 3, free stigmas sessile, uncinate, ovules erect. *Fruit* oblong, terete, 1 seeded, stigma terminal pericarp fleshy, endocarp membranous *Seed* oblong, ventrally grooved, albumen equable or subruminate, embryo dorsal or subbasilar —Species 10 or 11, African and Asiatic

The following attempt at diagnosing the Indian species of Phœnix is tentative, and awaits much further knowledge of the living plants before it can be accepted as trustworthy. The true Date, P dactylifera, has been introduced into Sindh and N W India —J D H

* Embryo ventral

† *Stem tall, (or short in P zeylanica)*

1 **P sylvestris,** *Roxb Hort Be g* 73 *Fl Ind* ii 787 trunk solitary stout petiole spinous leaflets 1 2 ft fascicled 2 4 farious rigid
uit 1 1¼ in long terete *M rt*
& Kae)*f*) 326 t 136 *Ku th*
n Calc Jo r i *A t H st* v 3o0
s Bomb Fl ° 8 *Brand For*
Uales ii 34 364 t 43 f 3
Elate sylvestris *Linn Sp Pl* 1189 i *part* Katou Indel *Ham in Trans Linn Soc* xv 86 —*Rheede Hort M l* ii t 22 °5

Cult vated throughout tl e pl ns of INDIA and BURMA W ld n tle Indus bas *A tch on*
Tr nk ° 40 ft clo l ed w th the pe s stent b ses of pet oles *Lea es* 10 15 ft
sl ort *Spad c* ere t fru ng

acute at botl en l but n o t
are
a
nd
nd
del c te tl an *sylvestr s* an l a *ul s* Tle *Elate* y *est* t L r s n ludes tl s and a Ceylon pal n (ee *P* a *ca*) —Gr ff l b er es t t l heed s figu r pre sents tl e fru t as e mu l e alle and of a l ffe ent l pe f on tl at of the Be gal pl nt The hol subj ct t c ful tu l

° **P zeylanica,** *T n e Jo Bot* 188ə °6‾ *Syst C t Zeyl Fl* °6 stem 15 ft or less leafl ts subequid tant quadr farious bright green r g d fru t ng spad x v th long slender spread ng branches fru t scarlet then dark p rple I zeylan ca *Hort Hook f* i *K Report* 188 63 I sylvestri *Th tes E u* 3 9 P pusilla *Cært* i *Fr ct* i. 24 t 3 *M rt H st Nat Pal* ii ° 3 321 t 136 (*partly as to de cr a d excl figs* x x n t W and 1 15 in t 1 4) Elate sylvestri *I n Sp Pl* 118) (*the C l pla t o l*)

CEYLON sl nd oods
S em 8 0 ft a ly l lorter *Leaves* r her sl ort leaflets very many not f c led 10 n l gent spre l ng t r l t a gl e *Fru t* 2 n or rather

3 **P rupicola,** *T Anler Jo r L n Soc* xi 13 trunk sol tary slender naked leafl ts 1½ ft bifar ous and not fasci led flacc d bright green fem spadix 3–4 ft long pelunel d fruit ¾ in long *Becc Males* iii 318 3?o P Andersoni *Cat Hort Calcut* No 119 (188–) p *? Gard Chr* 18 ii 1o fig 4 —Phœnicodea *Cr ff Journals* 46

SIKKIM HIMALAYA lt 400–1400 ft *A derson* ASSAM and the MISHMI HILLS *Griffith*
Trunk 15 °0 ft by 8 n diam *Leaves* 10 ft. qu te glabrous pet ole com pre d *Spad es* elo gated muel compre el femal s w th a few fasc cled spikes on tl e a ute u arg s u ar tl apex spathe 1 ft lon *Fru t* oblong sh n

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A prostrate æstuarial gregarious palm, stem (or rootstock) branched *Leaves* pinnatisect, leaflets lanceolate, plicate *Spathes* many, sheathing

1 celled 1 seeded carpels with pyramidal tips and infra apical stigmas, pericarp fleshy and fibrous, endocarp spongy and flowery *Seed* erect, grooved on one side testa coriaceous viscid within, and adherent to the endocarp, hilum broad, albumen equable, hollow, embryo basilar, obconic

1 **N. frutic**[illegible] *Blume*
Rumph ii 72, [illegible] *Lam*
Illustr t 897, *Bonite*,
t 67, *Kunth E*[illegible] *Notul*
iii 168, *Ic Pl Asiat* 244 *Roxb Fl Ind* iii 650, *Thw Enum* 327, *Kurz For Fl* ii 541

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16. PHŒNIX, *Linn*

Low or tall diœcious palms *Leaves* pinnate, leaflets lanceolate or ensiform, sides induplicate erect or drooping in fruit, branched, flowers small, yellowish, coriaceous petals 3, obliquely ovate, valvate, stamens 6 (3–9) filaments subulate, anthers erect, dorsifixed, pistillode minute or 0 *Fem fl* globose, calyx of the male, accrescent, petals rounded, imbricate, staminodes 6, or a 6-toothed cup, carpels 3, free, stigmas sessile, uncinate, ovules erect *Fruit* oblong, terete, 1 seeded, stigma terminal pericarp fleshy, endocarp membranous *Seed* oblong, ventrally grooved, albumen equable or subruminate, embryo dorsal or subbasilar —Species 10 or 11, African and Asiatic

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* Embryo ventral

† *Stem tall, (or short* in *P zeylanica)*

complicate above the middle pyramidal branches axillary drupes 1½ in diam *Kunth* i 231 *Griff in Calc Journ Nat Hist* v 317, *Palms Brit Ind* 114, t 220 L F *Wall Cat* 8616 Taliera bengalensis *Spreng Syst* ii 18 T Tali *Mart in Roem & Sch Syst* vii 1306

BENGAL, *Roxburgh*

Trunk about 30 ft, dark brown rather rough *Leaves* 6 ft long by 15 broad 90 100 fid lobes deeper and broader than in *umbraculifera* the central 3 3½ ft, petiole 5 10 ft not spirally arranged but circled spinous *Spadix* 20 ft or more high, primary branches with ascending tips secondary bifarious ... flowers in close clusters *Calyx* obscurely 3 lobed *Ovary* suddenly contracted into the style *Drupes* 1–3 dark olive or greenish yellow

4 **C. macropoda,** *Kurz in Journ Beng As Soc* xliii ii (1874) 197, t 15, *For Fl* iii 52; stemless leaves palmately flabellate 12–20 ft diam divided to the middle 6–10 ft long petiole 18 25 ft slender base as thick as the arm spines black, drupe the size of a cherry smooth olive brown

SOUTH ANDAMAN ISLDS *Kurz*

IMPERFECTLY KNOWN SPECIES

5 C MARTIANA, *Becc* ... panicle branchlets pendulous petiole armed with small strong black spines calyx broadly 3 lobed ovary conico ovoid narrowed into the short style drupe on a stipes ... in long

BURMA Mergui? (*Hort Calcutt*)

6 C UMBRACULIFERA *Linn* Wall Cat 8615 branchlets of panicle about 2 ft, as in *C Taliera* calyx distinctly 3 lobed ovary gradually narrowed into a short style —Hort Carey 1828 *Wallich*

18 NANNORHOPS, *H Wendl*

A gregarious tufted low growing glabrous palm with prostrate branching robust rhizomes or stems *Leaves* cuneately flabellate rigid plicate, split into curved 2 fid segments petiole short *Spadix* interfoliar much branched, spathes tubular sheathing spathels ochreate flowers polygamous *Calyx* tubular membranous unequally 3 lobed *Corolla* 3 partite, segments valvate *Stamens* in hermaph fl 6 in male about 9 *Ovary* trigonous, style short stigma 3 toothed ovules basilar *Drupe* small, globose or oblong 1 seeded style basilar *Seed* free erect, ventrally hollowed, hilum small, albumen equable embryo dorsal or subbasilar

1 **N. Ritchieana,** *H Wendl in Bot Zeit* 1879 148 *Aitchison in Journ Linn Soc* xix 149 141 and 187 t 35 Chamærops Ritchieana, *Griff in Cal Journ Nat Hist* v 342 *Palms Brit Ind* 135 *Brand For Fl* 547 *Gard Chron* 1880 602 (fig 128), *Mart Hist Nat Palm* iii 252

SINDH, and the WESTERN PANJAB on the Salt Range and at Kohat *Aitchison* —DISTRIB Afghanistan

Stem or rhizome 8 10 ft long as thick as a man's arm dichotomously branched ... long and broad which split to the ... often interposed fibres, petiole 6–12 in, ... ft branches ascending and recurved, ... a membranous spathella, one sessile

strongly conduplicate, fruiting peduncle 2 ft P humilis, var robusta, *Becc Males* 348, 584

BEHAR, on Parusnath, alt 4000 ft, *J D H*, &c

A very remarkable species from the great bulk of the trunks, and their tessellated appearance, due to the comparatively small size of the appressed old leaf sheaths, of which, judging from excellent photographs procured for me by Mr Clarke, there must be very many in a plane cutting the diameter of the trunk, they give to the trunk the appearance of a Cycas The figure of *P cycadifolia*, Regel, Gartenfl *1870, 131, t 974*, a plant referred to *dactylifera*, strongly resembles *robusta* in the bulk and marking of the trunk

17 CORYPHA.

Tall stout unarmed palms, dying after once flowering and fruiting *Leaves* very large, orbicular or lunate, flabellately multifid, petiole spinous *Spadix* very large, terminal, erect, paniculate, spathes many, tubular *Flowers* small, bisexual *Calyx* cupular 3 fid. *Petals* 3, connate below in a stipes ovate acute, imbricate or subvalvate *Stamens* 6, filaments subulate anthers dorsifixed *Ovary* 3 lobed, 3-celled, style short, subulate, stigma minute *Fruit* of 1–3 globose fleshy drupes, styles basilar *Seed* erect globose or oblong, albumen equable, embryo spiral —Species about 6, tropical Asiatic

1 **C. elata,** *Roxb Fl Ind* ii 176, trunk spirally ridged, leaves lunate, petiole with black margins and curved spines panicle rounded ... 1 in diam stipitate *Mart Hist* ... *Griff in Calc Journ Nat Hist* ... D C Gebanga *Kurz For Fl* ii ...

BENGAL and BURMA

Trunk straight 60–70 ft high by 2 ft diam *Leaves* 8 10 ft diam, 80–100-fid to about the middle, lobes ensiform, obtuse or 2-fid petioles 6–12 ft, spirally arranged, auricled *Spadix* about ¼ the height of the trunk much narrower in span than the foliage, supradecompound, spathes many *Flowers* in scattered fascicles ...

2 **C. umbraculifera,** *Linn. Sp Pl* *Fl* ii 1657, trunk annulate, leaves sublunate or circular palmately pinnatifid conduplicate above the ... s, drupes ... in 236, ... *partim*), ... 6 *Thw* ... ii 525, ... –12

MALABAR COAST and CEYLON

Trunk 60 80 ft diam *Leaves* 6 ft long by 13 broad, 80-100-fid to about the middle, segments obtusely 2 fid, petiole 7 ft, spines often in pairs *Spadix* attaining 20 ft, pyramidal branches spreading *Calyx* broadly 3 lobed *Ovary* suddenly contracted into the style *Drupe* shortly stipitate

3 **C. Talliera,** *Roxb Cor Pl* iii 251, t. 255, 256, *Fl Ind* ii 174,

trunk obsoletely annulate, leaves subrotund complicate above the middle subglaucous, basal lobes overlapping, panicle pyramidal, branches axillary to the spathes spreading, secondary forked, drupes 1½ in diam *Kunth Enum* iii 236, *Mart Nat Hist Palm* iii 231, *Griff in Calc Journ Nat Hist* v 317, *Palms Brit Ind* 114, t 220 E, F *Wall Cat* 8616. Taliera bengalensis *Spreng Syst* ii 18 T Tali, *Mart in Roem & Sch. Syst* vii 1306

BENGAL, *Roxburgh*

Trunk about 30 ft., dark brown, rather rough *Leaves* 6 ft long by 15 broad, 90–100-fid, lobes deeper and broader than in *umbraculifera*, the central 3–3½ ft, petiole 5–10 ft not spirally arranged biauricled, spinous *Spadix* 20 ft or more high, primary branches with ascending tips, secondary bifarious, drooping flowers in close clusters *Calyx* obscurely 3 lobed *Ovary* suddenly contracted into the style *Drupes* 1–3, dark olive or greenish yellow

4 **C. macropoda,** *Kurz in Journ Beng As Soc* xliii ii (1874) 197, t 15, *For Fl* iii 525, stemless, leaves palmately flabellate 12–20 ft diam divided to the middle 6–10 ft long, petiole 18 25 ft slender base as thick as the arm, spines black, drupe the size of a cherry smooth olive brown

SOUTH ANDAMAN ISLDS, *Kurz*

IMPERFECTLY KNOWN SPECIES

5 C MARTIANA, *Becc mss*, panicle hemispheric branchlets pendulous, petiole armed with small strong black spines, calyx broadly 3 lobed, ovary conico ovoid narrowed into the short style drupe on a stipes ¼ in long

BURMA, Mergui? (*Hort Calcutt*)

6 C UMBRACULIFERA *Linn*, *Wall Cat* 8615 branchlets of panicle about 2 ft, as in *C Taliera* calyx distinctly 3-lobed ovary gradually narrowed into a short style —Hort Carey 1828 *Wallich*

18 NANNORHOPS, *H Wendl*

A gregarious tufted low-growing glabrous palm, with prostrate branching robust rhizomes or stems *Leaves* cuneately flabellate, rigid, plicate, split into curved 2 fid segments, petiole short *Spadix* interfoliar, much branched, spathes tubular, sheathing, spathels ochreate, flowers polygamous *Calyx* tubular, membranous, unequally 3 lobed *Corolla* 3 partite, segments valvate *Stamens* in hermaph fl 6 in male about 9 *Ovary* trigonous, style short, stigma 3-toothed, ovules basilar *Drupe* small, globose or oblong, 1 seeded style basilar *Seed* free, erect, ventrally hollowed, hilum small, albumen equable, embryo dorsal or subbasilar

1 **N. Ritchieana,** *H Wendl in Bot Zeit* 1879, 148, *Aitchis in Journ Linn Soc* xix 149, 141 and 187, t 26 Chamærops Ritchieana, *Griff in Calc Journ Nat Hist* v 342, *Palms Brit Ind* 135, *Brand For Fl* 547, *Gard Chron* 1886, 652, *fig* 128, 129, *Mart Hist Nat Palm* iii 252

SINDH, and the WESTERN PANJAB, on the Salt Range and at Attok, *Aitchison* —DISTRIB Affghanistan

Stem or rhizome 6–10 ft long as [illegible]

the base ... many 3 partite spreading pubes
cent, flor ... pubescent calyx tubular
campanula ... nd intruded, petals rather
longer acute, ovary glabrous, ...

PERAK Scortechini, Goping King's Collector 469 8127

Stem 4–6 ft 1½ diam Leaves about 3 ft diam, petiole 5–6 ft, slender Spathes narrow 4–6 in long by ½ in broad subfurfuraceous, lower acutely keeled, mouth shortly lacerate Spadix 2½ 3 ft branches spreading and curved or flexuous, ... small tubercles which (in the dried state) are sunk in the lobulate ... lobed Fruit ½ in diam, rather longer ... carpels, dried pericarp ... petiole armed only at the base, the form of ... ply divided into large lobes

6 **L. triphylla,** *Griff in Calc Journ Nat Hist* v 352, *Palms* ... *Ind* 126, t 225, stem very short, leaves few flabelliform 3–9 partite, ... median narrowed into a petiolule, petiole very ... spathes very slender, calyx turbinate ... d flowers puberulous,

MALACCA forests Ayer Punnus, Griffith ... King's Collector (2860, 3007)

Stem 3 4 in Leaves with segments 8–10 in long of very various breadth, the tips of the central crenate with very short rounded notched lobes the lateral obliquely praemorse and notched petiole 2 ft not ¼ in broad spines ... Spathes 1½ 2 in long by ½ ¼ in diam mouth split Spadix a foot long very slender, branches short flowers ... in long scattered, subsessile Petals minute ... Seed with a curved internal process

7 **L. ferruginea,** *B ... mss*, leaves orbicular 3 7 partite, segments broadly ... the central ... petiolulate petiole very long armed almost throng... ... spathes large broad flattened furfura ceous ... flowers sessile ... ously tomentose,

SINGAPORE ... Lobb ... PERAK, ... 500 ft, King's Collector (3011)

Leaves 3 ft diam young furfuraceous towards the base below, segments merely notched ... as in L triphylla petiole 3 4 ft with concave face and sides, and rounded back young villously fur ... along the margin between the short stout spines Spathes 4 6 in long by 1½ 2 in broad ... d ... mouth lacerate Spadix very stout, with stout rusty tomentose branches ... in long, flowers sessile, ... in diam rusty pubescent Calyx very short ... rounded Fruit ½ in long, ... obscurely 3 ribbed when dry

†† *Branches of spadix and flowers glabrous*

8 **L. glabra,** *Griff in Calc Journ Nat Hist* v 329 *Palms Brit Ind* 121 t 223 ... stem slender, leaves flabelliform 16–18-partite segments linear cuneate median 2 3 ... tips with short bifid lobes separated by a broad sinus petiole very slender almost unarmed, spathes glabrous, spadix slender elongate and flowers quite glabrous branches alternate to the rachis far above the spathes 4 5 partite, calyx campanulate, petals lanceolate

MALACCA, Mt Ophir Griffith, Hullett (852) PERAK, on Gunong Batu Puteh, alt 3–4000 ft, King's Collector (8143), Scortechini (3199, 523?).

Ste ı 3 4 f 1 1½ n d am *Lea e* ° 3 f d a n ;]et ole 4–o ft plano convex *Spatl es* 3 6 rro cyl ndr tle lo v r a l ttle compressed ı outl obl que b f d t ps qu te ent re *Spad x* 4 f (K ng s spec me s) perfectly glabrous tl ro g ou r c s qu te sn ootl furrowe l l en dry bran hes 4–6 ın d var cate flo ers sub ess le *Cal yx* ob cu ly 3 lobed *Peta s* t v as lo g acum nate *Young fru t* ell pso l narro ed at bo en l keele l ½ n long st p tate by the c l x tube nd s]r d g]etals t pped l y l e r m s of tl short e carp ls

II Spathes compressed s] l t o one s l (tub lar ın *I K g*)

* *Spad x tl – e s] r] o el n ple r l r ı l ed ı flore ence*

9 **L modesta,** *Becc Ml les* ıı 19o stem elongate leaves semı circular segme ts very many arrowly cuneate pet ole very lon sp nous towards the base only spathes flatten l acutely edged glabrous marg ns of mouth qu te ent re branches of spad x and flo vers fulvous pul escent stamınal cup 6 lol ed ovary glabrous

PERAK Max ell l l *S rte l n* alt 3300 ft Larut *I ıng s Col ector* (191 19o1 1983 °1°0 3 43)

Stem 10 ft *Lea es* pa n t ly ul fi l s gme ts ° 3 nerve l pet ole 3 4 ft

from *a ut da*

10 **L Kunstleri,** *B c* st m rob st leaves long pet oled mid segment ı ot]etiolulate]et ole armed at the base spathe much com]ressed furfur ceous n outl not la rate branches of spadix very scurfily and rust ly ha ry flower] ed c l e l pubescent

IERAK on Ulu Bulo g *A n l r* (10 0o)

Se 4 ft l 4 o d (*yx* ca p ulate base arro e l pubesce t p t la r l lo (l v] f t sp c en seen ell l racter zed l y tle] l ell d fo r A l l to *c l fila* d l r g n tle robu t stem n nc br l r l f s g e t l lo floral] l e

11 **L acutifida,** *Ma H Nat P l ı* o t 1°o f 3 4 (excl Syn Roxb) sten sl d r leaves many long pet oled segments 1o–20 v ry narro v terminatıı ın lo g narro v l fid lobes med an pet olulate pet ole very sl nder shortly ar ne l and furfuraceous towards the base sp lıx s]athes and flo vers furfura eously vel ety flo vers seated on a ratl r] ro m ent p d l calyx obco ıc *Gr ff C lc Jo r Nat H st* v 3 *P l s B t I l l* t N B *H ll Cat* 8 18

IENANG *Ie l* S OAPO E *I*

Ste lo 0 ft l d n *Ie re* 1 ° ft l an segments 1 3-costate term nal lobe ¼ 1 u pet ole 15 48 l pul lo t *pathes*] leaceou s ur lob l l b lon l y s d u s lk y or lr ly] aleac u *Sp l* 1 18 u sp k 3 o s] e orf rke l ad at to tle r c l wer flowe s ° te]]ur so a y calyx obtusely 3 fi l pub scent pe als striat *O ary* o o o l smoo h st l t l fo n *Fr t* ½ d a t] tate by tl calyx S e l] lo

12 **L pusilla** *P cc M l s ı ı.* 194 st mle s leav s palmately 9 61 segn nts very ıarrow median 3-fid on 3 partite sl ortly and obtu ely toothed lateral w th very ol l] ıe t ps having several short and one long

tooth mouth of spathe lacerate, spadix nodding compressed, branches 3 simple subtomentose, flowers sessile, calyx campanulate pubescent, fruit very small pisiform

PERAK, at Semhi *King's Collector* (3028)
Closely allied to *L triphylla*, but leaf segments more numerous mid segment not petiolulate and branches of the spadix simple *Fruit* (dried) ¼ in diam — I have seen no flowers *J D H*

** *Spadix bearing a solitary simple or digitately branched inflorescence*

13 **L. Scortechini,** *Becc Males* iii 192, leaves semicircular sub 17 partite, segments with long 2 fid teeth, mid segments 9 lateral 1–3 nerved, spathes 2 acutely 2 keeled inflated above acute spadix and flowers fulvously pubescent, branches 4–5 filiform digitately branched, calyx ob-conico campanulate truncate, petals pubescent striate, staminal cup 6-toothed, ovary glabrous

PERAK *Scortechini*
Described from a single leaf and flowering spadix

14 **L. Kingiana,** *Becc Males* iii 193, stem slender, leaves small semicircular 5 partite segments broad obtusely obliquely toothed, median broadest sessile cuneiform petiole very slender spathes 2, outer tubular acuminate split at the side, upper very narrow mouth lacerate, spadix terminating in a solitary dense fld spike, calyx campanulate hairy, staminal cup 6 toothed ovary glabrous

PERAK at Goping *Kunstler* (471)
Stem about 5 ft by 1 in diam *Leaves* 10–12 in diam, segments all cuneiform many-toothed teeth [illegible]
armed from the lower third with [illegible]
slender ¼ ½ in diam nearly glab [illegible]
tomentose *Calyx* irregularly lo [illegible]
striate *Ovary* turbinate glabrous style subulate *Fruit* not seen

20 LIVISTONA, *Br*

[illegible] *Leaves* orbicular, flabellately plicate, split [illegible]es, petiole long, margins spinous [illegible]l, erect, fruiting pendulous, loosely [illegible] heathing, flowers minute, 2 sexual [illegible]la 3 lobed, coriaceous lobes valvate [illegible] in a ring, anthers cordate *Ovary* of 3 nearly free carpels, styles short free or coh rent, stigmas minute ovules basilar erect *Drupes* 1–3 globose oblong or ellipsoid, style sub-terminal *Seed* erect, ventral face hollowed, albumen equable, embryo dorsal —Species about 17 tropical Asiatic and Australian

L chinensis *Br* (L sinensis *Mart*) Griff *Palms of Brit Ind* 131, t 228 D; Ball Cat 8–0 a Chinese and Japanese s, ecies, is cultivated in India and may be recognized by its reniformly flabellate leaves with long pendulous deeply bipartite divisions and the olive like drupe

1 **L. cochinchinensis,** *Mart Hist Nat Palm* iii 242, leaves 9–10 ft. diam orbicular, lobes 2 partite, segments very long linear pendulous tips filiform, drupe globose ½–⅔ in diam *Becc Males* iii 69 L.

spectabilis, *Griff in Calc Journ Nat Hist* v 336, *Palms Brit Ind* 130, t 226 C Corypha Saribus, *Lour Fl Cochinchin* i 212 Saribus cochinchinensis *Blume Rumph* ii 49

MALACCA, *Griffith* PENANG *Lewis* —DISTRIB Cochin China

Trunk 50 60 ft, smooth *Leaves* about 90 fid divisions ensiform, central 2½–3 ft, petiole obtusely trigonous spiny throughout its length spines stout compressed recurved *Spadices* 4 5 ft nodding, branches 1–1½ ft, spreading much divided spathes coriaceous, brown *Flowers* sessile *Calyx* cupular obtusely 3-toothed to the middle corolla a little longer *Carpels* cohering by their styles *Drupes* pale blue, endocarp subopeous

L. J

ASSAM, common *Jenkins*

Trunk 20 30 ft by 6–7 in diam *Leaves* 5 6 ft broad, 70 80 fid, petiole spinous throughout its length *Spadices* 2 3 ft, branches dichotomous, simple or compound, spathes 2 ft, woody, scurfy *Flowers* clustered on small tubercles, small, greenish, ebracteate, calyx cupular base truncate intruded, corolla twice as long *Drupes* ¾–1 in diam, leaden blue

3 **L. speciosa,** *Kurz in Journ Beng As Soc* xliii ii (1874), 196, 204, t 13, 14, *For Fl* ii 526, leaves 6–7 ft diam, palmately flabellate divisions very shortly 2-toothed teeth lanceolate acuminate converging, drupe obovoid ⅔–1 in long

PEGU and TENASSERIM *Kurz Brandis*

Trunk 50–70 ft *Leaves* as broad as long divisions linear, petiole with very strong sharp long recurved flattish black spines throughout its length *Spadix* 2–4 ft, paniculate spathes brown smooth *Flowers* solitary or in pairs on small tubercles, sepals and petals about $\frac{1}{12}$ in *Drupes* ¾ in long dark blue

4 **L. Kingiana,** *Becc Males* iii 199, leaves 15 ft diam orbicular, divisions broadly lanceolate rigid 2 fid lobes triangular, drupe globose 1½–2 in diam

MALAY PENINSULA, Perak, *Kunstler* (3904)

Trunk 60–100 ft by 12–18 in diam
divisions 2 2½ in broad, petiole 6 ft,
flexuous very large stout spines like sh
branched, branchlets subulate slender
grumous and tessellated,

21 TRACHYCARPUS, *H Wendl*

Tall unarmed palms *Leaves* suborbicular or reniform, plicately multifid, segments narrow, rachis 0 *Spadices* many, interfoliar, stout, branched, spathes many, sheathing, embracing the peduncle and branches of the spadix, coriaceous compressed, tomentose, bracts and bracteoles minute, flowers small, polygamo monœcious *Sepals* 3, ovate *Petals* 3, broadly ovate, valvate *Stamens* 6, filaments free, anthers short, dorsifixed *Carpels* 3, stigmas 3, recurved, ovules basilar *Drupes* 1–3, globose or oblong, style subterminal *Seed* erect, ventrally grooved, hilum basilar, albumen equable, embryo dorsal —Species 2 or 3, Himalayan, Chinese and Japanese

1 **T. Martiana,** *H Wendl in Bull Soc Bot Fr.* viii (1861) 429, trunk for the most part naked annulate fem fl solitary sessile, drupe oblong ... grooved throughout its length *T khasiana, H Wendl l c*, Martiana, *Wall Cat* n 8621, *Hist Nat Palm* iii 251, 320, *Royle Ill* 391 7, 9 *Griff in Calc Journ Nat Hist* v 339, *Palms Brit Ind* 133 C Griffithii, *Lodd Cat Palm* 1841 *Hort Par ex Rev Hortic* 1879 212 f 43 ed 1881, 143 C khasyana *Griff in Calc Journ Nat Hist* v 341 *Palms Brit Ind* 134 t 227 A B C, *Brand For Fl* 546, *Kurz in Journ As Soc Beng* xliii 204 *For Fl* ii 526, *Gamble Man Ind Timb* 418 *Houllet in Rev Hortic* 1879 272 (*with woodcut*)

TEMPERATE HIMALAYA alt 6 8000 ft from Nepal eastwards, the KHASIA HILLS, alt 4000 5000 ft MUNNIPORE *Watt* BURMA alt 4–6500 ft, *Kurz*

Trunk 20–50 ft slender clothed beneath the crown with persistent leaf sheaths young parts softly furfuraceously hairy *Leaves* 4 5 ft diam, subglaucous beneath cut about half way down into linear 2 lobed segments, rigidly coriaceous, petiole 1½–2½ ft margins denticulate, sheath leaving stiff erect fibres *Spadix* 1–1½ ft, nodding glabrous, basal spathes 1 ft, coriaceous split *Flowers* yellow, ovaries villous *Drupe* 1–3 ⅓ in long, blueish, ' dirty blue' (*Kurz*) ' yellow lepidote (*Wall*)

2 **T. excelsa,** *H Wendl in Bull Soc Bot Fr* viii 429, trunk

5221

UPPER BURMA Yunan *T Anderson* —DISTRIB China, Japan

T excelsa closely resembles *T Martiana* except in the trunk being clothed with old leaf sheaths

22 PHOLIDOCARPUS, *Blume*

Trunk tall *Leaves* orbicular, 4–5 partite, petiole spinous *Fruit* globose or ovoid with a tessellated pericarp *Seed* laterally inserted hilum oval, albumen ruminate, embryo basilar —*Species* 5 Malayan, all very imperfectly known

1 **P. macrocarpa,** *Becc Males* iii 90, 92, t 9, f 1–3, fruit globosely obovoid 4–4½ in diam distinctly tessellate endocarp globose densely fibrous, fibres elongate ?P Ihur, *Miq Fl Ind Bat* 591 (*non Blume*) ?Livistona Diepenhorstii, *Teysm fid Miq l c*

MALAYAN PENINSULA Klang near Selangore *Kelsall*

Nothing further of this species is known it differs from the *P Ihur* of Amboyna in the larger more deeply tessellated fruits and the long fibres of the outer coat of the endocarp

23 CALAMUS, *Linn*

Armed erect or scandent tufted palms *Leaves* alternate, pinnatisect, leaflets acuminate nerves parallel rachis often produced into an armed

flagellum, sheath armed, produced into a ligula or ochrea, and with or without a lateral armed flagellum. *Spadices* axillary, usually elongate, much branched, sometimes produced into a flagellum. *Spathes* tubular or open, persistent, sheathing the peduncle and branches of the spadix and passing into bracts and bracteoles (spathels and spathellules). *Flowers* small, polygamo dioecious, in usually distichous often scorpioid spikelets solitary or binate (a fem. or male or both) in the bracteoles. MALE FL. *Calyx* cupular 3-toothed. *Petals* 3 acute, coriaceous, valvate. *Stamens* 6, filaments short, anthers dorsifixed. FEM. FL. slightly accrescent, fruiting pedicelliform or explanate. *Calyx* of the male. *Corolla* tubular below, 3-fid, valvate. *Staminodes* forming a cup. *Ovary* incompletely 3-celled, clothed with retrorse scales; style short or rather long, stigmas 3; ovules basilar, erect. *Fruit* globose or ellipsoid, style terminal, pericarp thin, clothed with appressed deflexed closely imbricating polished scales. *Seed* subglobose or oblong, smooth or pitted; albumen equable or ruminate; embryo ventral or basal.—Species about 160–170 trop. Asiatic, Malayan, Australian and a few trop. African.

[illegible]

GROUP I. *Leaves* with many equidistant leaflets. *Spathe* 1st, elongate-tubular, dilated and lacerate above; 2nd tubular, infundibular. *Spadix* with the partial infl. and spikelets provided with a pedicellar portion included in their respective spathes. *Fruiting perianth* explanate. *Spathellule* of fem. fl. short, not pedicelliform. Sp. 1–9.

GROUP II. *Leaves* with very few radiating or digitate leaflets, rachis not flagelliferous, leaf-sheath flagelliferous. *Spathe* 1st very long, tubular, mouth lacerate; 2nd thick, inflated, lacerate. *Spadices* male and fem. simply decompound; partial infl. and spikelets with a pedicelled portion inserted at the mouth or back of their respective spathes. *Fruiting perianth* explanate. *Spathellules* of fem. fl. short, not pedicelliform. *Fruit-scales* more than 12–15-seriate. *Seed* not ruminate, embryo basilar.—(Slender scandent species, stamens 2-seriate, filaments thickened at the base, tips not inflected). Sp. 10–12.

GROUP III. *Leaves* paripinnate, leaflets equidistant, rachis not flagelliferous, leaf-s[illegible]
sheathing [illegible]
the spathe) [illegible]
Spathellules [illegible]
alveolate, embryo basilar. Sp. 13–31.

GROUP IV. [illegible]
or not. *Spathe* [illegible]
nally split oper[illegible]
alveolate, albumen equable. [illegible]

GROUP V. *Rachis* of leaves not flagelliferous, sheath flagelliferous. *Spathe* 1st submembranous, at first elongate tubular at length longitudinally more or less split and partly sublaminar. *Fruiting calyx* more or

less pedicelliform *Spathellules* of fem fl pedicelliform *Seed* dorsally alveolate, albumen subruminate, embryo basilar Sp 40, 41

GROUP VI *Rachis* of leaves not flagelliferous, leaf sheath flagelliferous *Spathe* 1st tubular coriaceous, narrow, not split or lacerate *Spathellule* of fem fl exserted beyond the spathels, and as it were supported on a pedicel *Fruiting perianth* pedicelliform *Seed* superficially furrowed, albumen ruminate, embryo basilar Sp 42–43

GROUP VII *Rachis* of leaves not flagelliferous, leaf sheath flagelliferous *Spathes* tubular, strictly sheathing *Spathellules* not pedicelliform *Fruiting calyx* pedicelliform, albumen deeply ruminate Sp 44–47.

GROUP VIII *Rachis* of leaf not flagelliferous, leaf sheath flagelliferous *Spathes* strict, tubular, spathellules distinctly pedicelliform *Fruiting perianth* pedicelliform *Seed* with many plaits radiating from the centre to one face, embryo lateral Sp 48

GROUP IX *Leaf sheaths* flagelliferous, leaflets broad, many nerved, two terminal completely free with a very short interposed flagellum *Spathe* strict, tubular spathellules of fem fl not pedicelliform *Fruiting-perianth* subpedicelliform *Albumen* superficially ruminate, embryo basilar Sp 49

GROUP X *Rachis* of leaves flagelliferous, leaf sheath not flagelliferous *Spathe* elongate, tubular, narrow *Spathellule* of fem fl not pedicelliform *Fruiting calyx* pedicelliform *Albumen* ruminate or not, embryo basilar or lateral Sp 50–56

GROUP XI *Rachis* of leaves flagelliferous, sheath not flagelliferous *Spathe* narrow, elongate, tubular *Spathellules* of fem fl not pedicelliform *Fruiting perianth* pedicelliform or not *Albumen* not ruminate, embryo basilar Sp 57–63

GROUP XII *Rachis* of lower leaves or leaves of young plant not flagelliferous, of the adult plant or its upper leaves shortly flagelliferous, leaf sheath flagelliferous *Spathes* elongate tubular, narrow, spathellules of fem fl not pedicelliform *Fruiting calyx* distinctly pedicelliform *Seed* strongly dorsally alveolate, at least superficially ruminate? embryo basilar —Leaflets large or in any case with not fewer than 3 primary nerves Sp 64–70

GROUP XIII *Lec* [illegible]
ferous *Spadix* contr [illegible]
auriculiform above, [illegible]
perianth explanate [illegible]
Sp 71, 72

GROUP I See p 437

* Albumen ruminate, embryo basilar

1 **C. erectus,** *Roxb Fl Ind* iii 774, stems tall stout erect, leaflets concolorous subequidistant linear lanceolate margins and midrib beneath remotely ciliolate, spines of petiole and rachis and lower spathe in half whorls flat straight pale, spadices branched elongate ending

in a flagellum, spathels cymbiform acute, flowers 1/3 in long *Mart Hist Nat Palm* iii 332, *Griff in Calc Journ Nat Hist* v 35, *Palms Brit. Ind* 43, *Walp Ann* iii 438, v 829, *Kurz in Journ As Soc. Beng* xliii ii 209, t 23, 24 (excl longisetus), *For Fl* ii 516 C schizospathus, *Griff Il* cc 32 & 41, t 187, *Mart l c* 332, *Walp ll cc* 482, 829, *T Anders in Journ Linn Soc* xi 7

SIKKIM HIMALAYA, ASSAM, SILHET, CHITTAGONG, the KHASIA HILLS, MUNNIPORE and PEGU, ascending to 4000 ft

Stems densely tufted 12–18 ft high, internodes 2–3 in long, 1–1¼ in diam *Leaves* 12 18 ft, leaflets few, 1½–2 ft by 1½–2 in 1-nerved, young petiole furfuraceous, spines on the full grown petiole ½ in and upwards *Spadices* 1 2 ft, spikes 6–10 in by ½ in across the imbricating coriaceous spathels *Calyx* acutely 3-toothed, corolla thrice as long *Stamen* free, filaments broad, erect *Fruit* about 1 in long ovoid oblong, subtended by the spreading perianth, scales trapezoid, dark brown with a yellow base

Var β COLLINA, *Becc*, smaller, petiole with solitary or sparingly clustered spines, spadices shorter often depauperate shortly peduncled, tip not or shortly cirrhiferous, fruit ellipsoid C collinus, *Griff in Calc Journ Nat Hist* v 31, *Palms Brit Ind* 39 (*excl leaf*), t 186 (*spadix only*) —Khasia hills

Var γ MACROCARPA *Becc* fruits larger C macrocarpus, *Griff in Mart l c* 333, t 176, f x *Griff Palms Brit Ind* 40, t 186, A f i ii *Walp ll cc* 481, 830 —Sikkim, &c

2 **C. flagellum,** *Griff in Mart Hist Nat Palm* iii 333, t 176, f ix, stem stout at length scandent leaflets subopposite linear lanceolate con-

Jenkinsianus, *Griff l c* 40, t 186 A, f iii (*not* 89) ?C polygamus, *Roxb Fl Ind* iii 780

SIKKIM HIMALAYA, ASSAM, SILHET, and the KHASIA HILLS, ascending to 4000 ft

Stem 1 1½ in diam *Leaves* 6 7 ft leaflets 2 2½ ft by 1 1¼ in broad, concolorous, petiole 1 1½ ft *Spathes* tubular lowest 1½ 2 ft, compressed, upper lacerate *Spadix* 8–10 ft, spikes 8–10 in, pendulous, unarmed, spathels very like C *erectus* *Flowers* ¼ in long, decurved *Calyx* 3 fid to the middle *Corolla* twice as long *Stamens* free *Fruit* 1 by ¾ in, ovoid oblong cuspidately beaked, subtended by the spreading perianth, scales deeply furrowed, pale with a dark band down the middle

** Albumen equable

† *Erect or scandent No flagellum on leaf sheath or spadix.*

3 **C. arborescens,** *Griff in Calc Journ Nat Hist* v. 33, *Palms Brit Ind* 42, t 188 A, B, C, stem erect tufted stoloniferous, leaflets equidistant linear lanceolate white beneath margins closely setulose, midrib beneath and sometimes above setose, petiole scurfy, armed with whorls or half whorls of long flat black spreading spines, spadix very long pendulous, spathels very short closely imbricate truncate *Mart Hist Nat Palm* iii 332, *Walp Ann* iii 483, v 829, *Miq Fl Ind Bat* iii 113, *Kurz in Journ As Soc Beng* xliii ii 203, t 22, *For Fl* ii, 516 C hostilis, *Hort Calc*

nodes 7 in, crown densely leafy. *Leaves* 1¼ broad petiole naked except for the long *Lower spathes* with many half whorls of short black spines upper short, unarmed *Spadices* longer than the leaves very graceful, spikes 4–6 in long by ¾ in across the flowers, which are nearly ½ in long, curved *Calyx* trifid to the middle *Petals* oblong-lanceolate, acute *Stamens* shortly monadelphous

4 **C. castaneus,** *Griff in Calc Journ Nat Hist* v 28, *Palms Brit Ind* 37 t 185 A, B, C stem very short stout, leaves very long,

331, *Walp Ann* iii 182, v 829, *Miq Fl Ind Bat* iii 112

MALACCA *Griffith Maingay* (*Kew Distrib* 1533), PERAK at Gopung *King's Collector* (5880)

Stem 3 5 ft, with the sheaths 3 4 in diam *Leaves* with the petiole 12 15 ft, leaflets 12–24 by 1 2½ in very dark green, young scurfy beneath, petiole as thick as the little finger, rounded with a channelled upper surface *Spathes* generally unarmed *Spadices* 2–3 ft, male panicled, elongate flexuous, fem shorter, nearly as broad as long, simply branched spikes of male 2–3 in, of fem much larger, scorpioidly recurved ½ in broad *Male fl* ⅙ in long *Calyx* trifid to the middle *Petals* hardly longer *Stamens* inflexed in bud *Fem fl* larger *Fruit* 1 in long, ellipsoid embraced at the base by the erect perianth, strongly beaked, scales in 24 26 rows minute dark brown

5 **C. Griffithianus,** *Mart Hist Nat Palm* iii 332, closely allied to *C castaneus* and dwarf like it, in the leaflets spadices &c but the petioles are described as terete, and the fruits are larger more globose with fewer (18 20) rows of larger scales *Walp Ann* iii 482, v 829, *Miq Fl Ind Bat* iii 112 C castaneus (*partly*) *Griff in Calc Journ Nat Hist* v 29 C castaneus, var α *Griff Palms Brit Ind* 38

MALACCA, *Griffith* PERAK, *King's Collector* (3040, 3048)
Probably only a form of *castaneus*

†† *Scandent, stout Leaf sheath flagelliferous Spadix long, often flagelliform Spikelets much flattened*

6 **C. longisetus,** *Griff in Calc Journ Nat Hist* v 36, *Palms Brit Ind* 44, t 189 A, B, scandent or erect? glabrous leaflets lanceolate concolorous, lower fascicled 3 costate, margins and midrib above and beneath and lateral nerves beneath setulose, terminal connate, petiole and its sheath and lower spathes densely armed with whorls and half whorls

orter ones,
l, spathels
very stout
830, Miq
[illegible]

PEGU, *Hort Bot Calc*, *Griff* (*Kew Distrib* 6392), *McLelland*, BURMA, and the ANDAMAN ISLANDS, *Kurz*

Stem upwards of 1 in diam *Leaves* 4–8 ft, rachis not flagelliferous, leaflets 1½–2

ft by ' ° in pet ole and rach s pale smootl except for tl e sp nes sl eatl s very strongly arn ed *Male spad x* slender br ncl ed *fem* mucl stouter and shorter *Lower sl athes* elongate tubular compres ed strongly a me l upper short lacerate spathel densely nb cate scurfy trunc t often l cerate *F u t l* st p tate by the erect pe tl scal s lon, an l bro l lat tl n y llo v l tl very broad lu e bro b d acro th l lle a l h b ate n rgns tl e whole fru t banded l ke t e sk n) (r ff t l s r s *on* t *s* as rect n l Kurz *t grin s* as scandent

" **C Thwaitesii,** *Bec* l ffers from *C lo g t* n tl e ach s of the petiole bearing very stout recur ed cla vs with black t ps the pper spathes bearing scattered sp ne cent tubercles and in the smaller fruits with fewer paler tumid scales erose or the margin channelled down the centre and with a narrow brown marg nal ban l C longisetus *Th e L u i* 330 (*not of Cr ff*)

CEYLON n tl e Central P o nce *Tl a te* CANARA *R cl e Talbot*
A Canara pl t co le ed by R tcl e and Talbot probably belo gs l e e tl e fru t s exactly s n l r to th t of the Ceylon plant

††† *Sc de t sle le Le f sl eatl fl gell fe is Sl kelets short scorl o d*

8 **C leptospadix** (*ff Calc Jo r \ t H t* v 19 *I tl s Brit Ind* 60 t 134 A B C leaflets very many close set narrowly l near acuminate marg n and sometimes the 3 costæ beneath setulose or aculeo late petiole terete and scurfy rach s vitl distant stra ght flattened sp nes and a few hort claws at the base sheath short scurfy sparingly armed spadices very long slender pendulous with very many distichous short recurved spines lower patl es long slender densely arn ed with flat thin spil es and m nut rec rved ones upper shorter unarmed flowers small fr t small globe e mucro ate *Ma t H st Nat Palm* i i 335 f ii *W lp An i* 18 v 483 *T A l Jo rn I n So* xi 8

SIKKIM H MALAYA *J D H* &c KHASIA HILLS *Griffith* &c MUNNIPORE and NAGA HILLS *Wat*
Stem l nde sc n l nt *Leaves* 3 4 ft leaflets 8–10 by ⅓–½ n th n pale green racl s ar ne l th n l le r curved sl nes *Spa h s* ve y slender tubul r *Spad ces* sev r le t lo g b au l d b lo v aud arm d w tl l ooked sl ort sp n s br ncl es very long an l l der w th 30–40 rec r l p k lets ½ 1 in lo g an l ½ in d a fl gellum ot sp d x ery long r ned w tl 1 3 fil recur ed claws. *Sl thels* cupular acute n e b anou *Male fl* ⅓ lo c lyx 3 fi l to the m ddle petals t ce as long *Fr t* n d a n subtended by tl e spread ng per anth scales very small broad yel o tl red bro n i ar n

9 **C rivalis,** *Tl ex I e Jo r Bot* xxm (1885) 268 (*Frr tyl* n val s) l ib t of *C l ltop l r* l aflets num rous equ distant

n any s o t u ta l recur ed t pr ckles fru t small ovo d beaked C rudentum *V rt H st Nat Pal* i i 340 (*non Lo r*)

CEYLON *Wall r &c*
Leav s about 3 ft o g l af ts 12 18 by ⅓ ½ n broader and more cor aceous than in *C long setus* racl s scurfy *Spathels* very obl quely cup shaped, coriaceous. *Male fl* crowded calyx t fil to the m ddle *Petals* and *stamens* st p tate *Fem fl.*

costæ beneath armed with rigid bristles, the central alone sparsely setulose above, rachis armed beneath and at the margins with short hooked scattered spines, sheath densely armed with scattered flat spines, lower spathe densely armed upper and spathels finely scabrid, spadices very long

PERAK, *Scortechini* (468b), Goping *King's Collector* (8171).

A lofty climber, stem with the sheaths 1–1½ in diam *Leaves* 2–2½ ft, larger leaflets 18 by 1 in, upper much shorter and shortly connate at the base *Lower spathe* elongate-tubular, with short spines on the outer faces, upper scabrid and scurfy with a lacerate mouth *Spadix* with the partial inflorescences very long, bearing many recurved spikelets *Fruit* small pisiform, long beaked —Well characterized by the armature of the sheath, the naked margins of the leaflets, and the scabridity of a portion of the spadix

17 **C. viminalis,** *Willd Sp Pl* ii I. 203, var FASCICULATUS, *Becc mss*, stem rather stout, leaflets many inequidistant or fascicled 3 costate, margins and costæ beneath spinulose, floccose rachis and petiole with scattered long straight spines, sheath and flagelli with scattered short hooked spines, spadix very long clothed with long spathes, tip flagelliferous, branches paniculate, spikes 4–5 in, lower spathes compressed with subulate spines, upper prickly, f

iii 779 (*excl cit*

iii 338, t 116,

Hist v 52, *Pa*

f ii, *Miq Fl*

As Soc Beng

LOWER BENGAL, ORISSA, and the CARNATIC, CHITTAGONG, BURMA, the ANDAMAN ISLANDS and PENANG, *Wall* —DISTRIB Cochin China (Of the type Malay Islands)

A stout scrambling and climbing species *Leaves* 2–3 ft, leaflets 4–10 by ⅜–⅞ in, pale green, young and rachis and sheath white-floccose, petiole short and rachis very stout, spines slender ½ 1¼ in long, pale hardly flattened *Spathes* coriaceous, mouth obliquely truncate, flagelli with hooked 2–3 fid claws *Spadix* and its spreading branches rather stout, internodes (and truncate spathels) ⅓–½ in *Fruit* ⅓–½ in diam, scales pale yellow, obscurely channelled down the middle

18 **C. concinnus,** *Mart Hist Nat Palm* iii 332, erect or stemless?, leaflets many subequidistant linear lanceolate acuminate glossy above 3-costate, margins and costæ beneath setulose, rachis and spadix

TENASSERIM, *Wallich*, at Mergui, *Helfer* (*Kew distrib* 6388, 6394, 6395)

Leaflets in the only specimens I have seen 10–18 by 1–1½, very shining on both surfaces. *Fruit* ½ in diam

19. **C. floribundus,** *Griff in Calc Journ Nat Hist* v. 50, *Palms*

Brit Ind 60 t 197, leaflets few inequidistant linear lanceolate acuminate uppermost crowded at the end of the rachis and often connate margins and costæ beneath setulose petiole lower spathe and rachis armed with very short stout and long scattered flattened pale spines sheath densely armed with needle like setæ and spines spadix elongate decompound, internodes sheathed by truncate ciliate spathels spikes short spreading and recurved lower spathe very long keeled fruit globose shortly beaked *Mart Hist Nat Palm* iii 337 *Walp Ann* iii 487 v 831 C mishmiensis *Griff Il cc* 59 and 65, *Mart l c*, *Walp Ann ll cc* C multiflorus, *Mart* — *Wall Cat* n 8613

ASSAM SILHET and the KHASIA HILLS *Wallich* &c MISHMI HILLS, *Griffith*

Stem as thick as the middle finger *Leaflets* bright green, 10–18 by 1 1½ in, spines of rachis ½–1 in long rather flattened and deflexed *Lower spathe* 18 in, coriaceous, terete mouth very oblique *Spathels* acuminate, and flowers almost floccose with long white hairs striate *Flagelli* with short or long simple or compound recurved claws and spines *Fruit* ½ in diam, scales very pale yellow, channelled down the back

20 **C. pseudo-tenuis,** *Becc mss* leaflets many equidistant linear

CEYLON in the hotter parts of the island DECCAN PENINSULA, on the

in, upper free, rachis rather stout, ...s flattened lower 2 edged, spathels ... t of fruits ... s rounded, ... the equi... by Talbot ... has black ... rved male

21 **C. densiflorus,** *Becc mss*, leaves very shortly petioled, leaflets many equidistant linear ensiform finely acuminate concolorous upper gradually smaller terminal very short margins setulose costæ 3 all spinulose above and sparsely setulose on the middle one only beneath, sheath strongly armed with pale flat horizontal spines, spadix very long, spikes elongate dense fld, spathels and spathellules scabridly pubescent, fruit small beaked ovoid

... rigidulous, larger ... , gibbous above, ... stout, clawed

22 **C. luridus,** *Becc mss*, leaflets rather numerous equidistant remote

Miq Fl Ind Bat iii 117 C Roxburghii, *Griff in Calc Journ Nat Hist* v 43, *Palms Brit Ind* 55 t 195 A (*under fasciculatus*) (and t 112 ? *monoicus*, Roxb), *Thw Enum* 330 C monoicus, *Roxb Fl Ind* iii 783, *Mart l c* (209, Ed 1) 334 (*excl descr*) *Wall Cat* n 8601?, *Griff ll cc* 48 and 58 *Kunth l c* 208, *Walp ll cc* 484 and 830 C scipionum, *Lam* (*in part*) *Encycl* vi 304 ((*excl Syn Lour & Rheede*)

THE DECCAN PENINSULA and CEYLON

Stem scandent very slender *Leaves* 2 3 ft, leaflets 8–10 by ⅓–⅔ in, median costa unarmed on both surfaces or armed beneath only, lateral unarmed on both surfaces, in Madras specimens there is often a strong solitary spine above the base of the leaflet on the midrib beneath sheath in Madras specimens with horizontally flattened spines *Spadix* and its slender tubular spathes unarmed or nearly so *Male fl* biseriate but not distichous, densely crowded ⅙–⅕ in long, spathellules acuminate *Fruit* ⅔ ¾ in diam, scales with an obscure sometimes discoloured channel, margins not or faintly narrowly discoloured

29 **C. Brandisii,** *Becc mss*, stem slender, leaflets few fascicled lanceolate ensiform naked beneath sparsely setose above on the 3 costæ petiole slender with few very long slender straight spines rachis with long stout solitary straight and recurved spines sheath armed with solitary or aggregate slender flattened straight spines mouth with very long needle shaped spinules, male spadix elongate shortly flagelliferous with few partial inflorescences, spathes narrow tubular upper funnel shaped unarmed embracing the bases of the spikelets, flowers 4-seriate in bud

TRAVANCORE at Courtallam, alt 3 5000 ft *Brandis*

I have seen no specimen of this species which appears from a photograph to be remarkable for the long straight very slender spinules at the mouth of the leaf sheath —*J D H*

30 **C. Feanus,** *Becc mss*, stem scandent leaflets few remote subequidistant elliptic lanceolate or oblanceolate 7–9 costate petiole very short and rachis armed with short hooked spines, sheath flagelliferous coriaceous green marbled with black scurfy spots strongly armed with scattered long spreading or deflexed and short stout reflexed spines male spadix decompound erect rigid with 7 partial inflorescences lower spathe tubular 2 keeled mouth compressed keels armed with short stout spines, upper truncate obliquely, spikelets recurved fruit broadly ovoid

TENASSERIM, alt 3 5000 ft *L Fea*

Stem scandent internodes ¾ ½ in diam *Leaves* rather short, about 3 ft 3 in long sheath ⅓–⅔ in, ochrea very short truncate leaflets 6 8 the larger 8–12 by 2–2½ in *terminal free* *Male spadix* 1½ in *Fruit about* ⅝ *in by* ½ *diam*, beak conical acute scales about 15 seriate, not channelled on the back, where they are opaque and as it pulverulent with a broad rather discoloured band *Seed* deeply pitted —Near *acanthospathus*, but very distinct by the opaque not channelled scales of the fruit

31 **C. acanthospathus,** *Griff in Calc Journ Nat Hist* v 39, *Palms Brit Ind* 60 t 190 B (*excl* A, f 1), leaflets few large inequidistant elliptic lanceolate strongly 5–7 costate usually unarmed on both surfaces, rachis and long petiole very stout scurfy and armed with 2–3 series of very stout recurved spines sheath stout densely armed with long flattened and short stout straight or recurved spines, spadices very stout flagelliferous, peduncle armed with unequal subulate spines, lower spathe very stout tubular compressed with a lanceolate limb back armed with conical based spines upper spathes clavate unarmed, partial

inflorescence sheathed up to the spikelets fruit obovoid or globose shortly beaked brown *Mart Hist Nat Palm* iii 333, t 176 f vi, *Walp Ann.* iii 484 v 830 C montanus, *Anders in Journ Linn Soc* xi 9

EASTERN NEPAL SIKKIM and BHOTAN HIMALAYA, ascending to 6000 ft, *J D H*, &c KHASIA HILLS alt 2 1000 ft *Griffith* &c

Stem slender, scandent as thick as a swan's quill *Leaves* 2 3 ft, leaflets 10–16 by 2–3 in, margins naked or spinulose both surfaces quite naked or very rarely with a few small spines on the costæ of the upper surface, flagellum of the sheath 10–12 ft *Spadix* 4–6 ft erect armed with short recurved spines, branches of fruiting spadix very stout spikes 1 4 in, strongly recurved *Lower spathe* 1 ft, scurfy, as thick as the thumb uppermost glabrous *Fruit* ¾ in diam pericarp thin, scales chesnut brown obscurely channelled, shining, fruiting calyx large, cupular, ½ in diam, lobes very short *Seed* deeply pitted

GROUP IV See p 437

32 **C. Guruba,** *Ham in Mart Hist Nat Palm* iii 206 and 330, t 175, f 1, leaflets alternate equidistant narrowly linear, margins and 3 costæ above setose midrib usually alone setose beneath, long slender petiole and rachis armed with long brown recurved and short conical spines below and on the margins sheaths flagelliferous covered with long flattened spines and crowded smaller ones spathes glabrous tube of lower compressed margins with long spines back with short ones, limb recurved, upper spathes nearly unarmed, male spadix elongate very slender decompound spikes spreading very slender, spathellules very shallow, flowers distichous pointing forwards fruit pisiform apiculate *Griff in Calc Journ Nat Hist* v 42 *Palms Brit Ind* 54 *Kunth Enum* iii 210 *Kurz in Journ As Soc Beng* xliii ii 214, *For Fl* ii 522 C Mastersianus, *Griff ll cc* 76 and 84 t 206 Dæmonorops Guruba, *Mart l c* 330, *Walp ll cc* 479 and 828, *Miq Fl Ind Bat* iii 100

34 **C. platyspathus,** *Mart Hist Nat Palm* iii 210, leaflets few scattered alternate ensiform acuminate strongly 5–7 costate, margins

costæ almost unarmed, rachis armed with straight and recurved strong solitary and binate spines with swollen bases, sheath armed with close-set straight subulate spines, male spadix long very slender sparsely shortly armed, inflorescences short subsessile paniculately branched, spikelets very short few fld upper spathes with very short sheaths and flat linear oblong lamina, spathellules very short acute, corolla twice as long as the calyx not striate *Griff in Calc Journ Nat Hist* v 75, *Palms Brit Ind* 53, *Kurz in Journ As Soc Beng* xl 214. C polyspathos, *Wall. Cat* 8610 Dæmonorops platyspathus, *Mart l c* Ed 2, 206, 329, *Miq Fl Ind Bat* iii 99, *Walp Ann* iii 479, v 828

TENASSERIM, at Tavoy, *Gomez*

Leaflets 10 12 by 1-1¼ in rigid, margins bristly towards the apex, young pale softly scurfy beneath margins thickened with obscure distant asperities *Upper spathes* 3-4 by ½-⅔ in, flat *Inflorescences* of male spadix as long as their spathes, very compound, spikelets ¼-½ in *Flowers* $\frac{1}{10}$ in long, pale, close-set pointing forwards *Calyx* sharply toothed, striate *Fem spadix* and fruit unknown

35 **C. paspalanthus,** *Becc mss*, leaflets equidistant close set very narrow finely acuminate 3-costate costæ closely spinulose beneath more remotely above margins nearly smooth, petiole very long white armed below with flat appressed long and short spines, rachis brown scurfy rounded beneath with short recurved single and trifid spines, lower spathe very long tubular armed with short spines male spadix stout erect decompound with erect branches and very short lacerate spathels, spikes erect very dense fld, spathellules closely imbricating lunate very strongly nerved flowers minute

PERAK at Goping *King's Collector* (577) —DISTRIB Borneo.

Leaves not flagelliferous, *leaflets* 4 10 by ⅓ in shining, strict, *petiole* about 2 ft white, but covered with a fine brown scurf when young sheath flagelliferous *Spadix* quite unlike any other from the upright branches and spikes, and the lacerate short membranous spathels *Spikes* ½-⅔ in strict like those of some *Panicum*, spathellules very peculiar flabellately nerved *Male fl* distichous, spreading horizontally, $\frac{1}{15}$ in long *Calyx* cupular striate, broadly obtusely lobed *Corolla* not twice as long, petals broadly elliptic, obtuse, obscurely striate —I have seen no complete spathe Described from Borneo specimens collected at Sarawak by Lobb, which Beccari says are identical with those from Perak (which I have not seen) He adds that its affinities are uncertain, and it is perhaps allied to *C leptospadix*

36 **C. ramosissimus,** *Griff in Calc Journ Nat Hist* v 78, *Palms Brit Ind* 87, t 207, leaflets very large scattered ensiform or elliptic lanceolate acute coriaceous many costate margins and costæ sm oth, petiole very stout armed below with scattered very long straight flat and many small spines, rachis very stout back rounded armed with broad short recurved solitary and 2-3 nate claws, male spadix ovoid decompound erect densely branched, peduncle very stout tomentose, branches and spikes erecto-patent spathes very large blade thickly coriaceous lower with a spinous tube upper open fem spadix furfuraceous with very stout simple spikes spathellules of both sexes very short Dæmonorops ramosissimus, *Mart Hist Nat Palm* iii 330, *Miq Fl Ind Bat.* iii 100, *Walp Ann* iii 479, v 828

MALACCA? *Griffith* PERAK, Larut, on Gunong Tjuk *Scortechini* (51b, 1233); alt 2,000-3 00 ft, *King's Collector* (2017 2910 6312 7181)

Stem 20 30 ft, scandent 1-1½ in diam *Leaves* 6-8 ft, dark green, glossy, leaflets 12 24 by 1½-2 in, 7-13-costate, almost plicate, rachis as thick as the little finger plano convex, spines ½-1 in l r g, recurved, longer spines on lower part of petiole 1½ in, on sheath 2-3 in *Blade* of lower spathe 1-2 ft by 1-2 in. *Info-*

rescences of male spadix 10–12 by 3 4 in, furfuraceous, peduncle as thick as the little finge[illegible]
1 1½ in, [illegible]
Calyx shor[illegible]
Fem spad[illegible]
globose with a very stout beak, scales all brown —Described from a Perak specimen, the male spadix of which does not resemble the slender lax flowered one of Griffith's t. 207.

37 **C. perakensis,** *Becc mss*, stem erect very short, leaves terminal, leaflets very numerous equidistant strictly ensiform acutely 3 costate above spinulose on 3 costæ above and only on the median beneath, petiole long armed with long stout horizontal marginal spines, male and fem spadices subsimilar strict erect more or less sprinkled with white cottony tomentum, spathes unarmed much compressed shorter than their respective partial inflorescences, fem spadix not very decompound, flowers cylindric

PERAK, *Scortechini* (317[b])

The above description is from Beccari's notes who adds that it is a very distinct species, somewhat allied to *C ramosissimus* —I have seen no specimen *J. D H*

38 **C. hypoleucus,** *Kurz For Fl* ii 523, leaflets alternately and interruptedly approximate by twos on each side oblong lanceolate acuminate ciliate towards the apex white beneath many-costate, petiole short armed with long and short conical straight and recurved spines, rachis with scattered recurved spines, sheaths densely spiny with unequal spines 1 in long and less, fem spadix small short, peduncle slender spinous, spathes oblong lanceolate, spathels tubular small distant, flowers distichous, calyx $\frac{1}{24}$ in shortly 3 lobed, corolla twice as long segments acute Dæmonorops hypoleucus, *Kurz in Journ As Soc Beng* xliii ii 208 (*partim*), t xviii (excl t xix)

BURMA, on Thoungyeen, *Brandis*

Stem slender, scandent, as thick as a goose-quill without the sheaths *Leaves* 2–3 ft, not flagelliferous, sheaths flagelliferous, leaflets 6–9 in long *Fem spadix* 12 in. long, peduncle about 1 in Male fl and fruit unknown —Description from Kurz. I have seen no specimen *J D H.*

39 **C. myrianthus,** *Becc mss*, leaflets very long narrowly elliptic-lanceolate many-costate pale almost white beneath smooth on both surfaces or with minute bristles on the costæ beneath, margin obscurely aculeolate, rachis dorsally rounded shortly spinous, male spadix very long slender sparsely spinous, spathels tubular truncate, inflorescences laxly decompound, branches very slender, spike ½–⅓ in zigzag almost filiform, spathellules minute, flowers minute pointing forward closely imbricate, calyx acutely 3 lobed striate, corolla twice as long acute estriate Dæmonorops hypoleucus, *Kurz in Journ As Soc Beng* xliii ii. 208 (*partim*) t xix

TENASSERIM, at Mergui, *Helfer* (*Kew distrib* 6397)

The only materials for this species seen by me are Helfer's specimens, consisting of a portion of the rachis of a leaf with two leaflets and portions of a male spadix, [illegible]

GROUP V See p 437

40 **C travancoricus,** *Beddome mss*, leaflets in distant opposite grouns of 3 5 narrowly o lanceolate acuminate thin costæ 3 very slender naked above sparsely setulose beneath rachis and pet ole very slender armed with small stra ght and recurved spines sheath armed with slender stra ght flattened prickles spadix long slender flagelliferous inflorescences shorter than the membranous flat spathes male d compound fem w th simple d stich is sp k s upper spathes and spathels tubular obliquely truncate spathell iles sl ort acute calyx strongly striate corolla estriate twice as long —*Rheede Hort Mal* xii t 61

DECCAN PENINSULA from Malabar to Travanco e *W ght Beddome*
Ste n very slender s and t *Lea es* 18 k u leafl ts 4 ° by ½ ⅜ in broadest about or bove tl e m ddle and tl en e taper ng to a c p ll ary po nt sn n ng above rachis curfy wl e young pet ole 4-6 n dors lly r u led marg ns acute much co npressed to vards th b se a d there ch efly sp ny *Spad x* flagell ferous 2 3 ft pe luncle short flatt n d your vl te scurfy mar ns sl ortly sp ny *Lower spathes* tub lar compress d at the ba e with sl ortly s no s angles produced i to a long e bra n s sheatl la n a upper w th unarmed t bes *Inflorescences* about 2 in lou n al s tl sp e l ng ery slender br c es be r n short flexuous al nost cap llary sp kes of flo ers ½ n long fem w th s nn e r curved sp kes and rather larger flo ers —Rhee le s figure is very good for its t m

41 **C Rheedei,** *Griff in Calc Journ Nat Hist* v 73 *Palms Brit Ind* 36 83 leaflets in very distant g oups of 3 on a long rachis armed with scattered short re urved spines linear lanceolate acum n ate fr iting spadix with tl e flat open acute spathes longer than tl e ovoid dense clusters of ell pso d or oblo g fru t Dæmonorops Rheedi *Mart Hist Nat Palm* ii 330 *Miq Fl I d Bat* iii 100 *Walp Ann* iii 479 v 8 S —*Rheede Hort Mal* xii t 65

MALABAR *Rheede*
O th s spec es noth ng s known beyond Rl eede s rude plate wh ch is very infe r or to th t of C *tra ancoricus* from wl ch t d ffers n the m ch l n er l af the leafl ts b g grouped n tl ees one of each group apparently on ne s de of the rach s au l 2 on tl e otl er four leaflets ter n nate the rach s ll e fru ts are repres nted as ⅝ in long by ½ in broad a l very sl ortly be ked Beccar th nks that a *Calamus* fr i t s t from Malabar to Kew by Major Campbell exact y corresponds to Rheede s figure

GROUP VI See p 438

42 **C Huegelianus,** *Mart Hist Nat Palm* iii 338 leaflets many equ dista t elongate ensiform acuminate strongly 3 costate marg ns smooth unarme l above l eneath pale and w th a very few long bristles on tl e lateral co t æ petiole stout young scurfy back rounded with very stout short recurved sp es sl eath armed w th very stout scattered long and short spines f u sp d x sto it erect spatl es sparingly armed witl stout claws n arr y tul ular truncate f i t n branel es 6-10 in very stout, sp kes recurved c il x pe l c ll d cnt ular with sprea l ng lobes fruit globose black shin ng *Walp Ann* iii 488 v 811 C Wightii *Griff Palms Brit Ind* 10 t 186 C (n elu o s *H Weall in Kerel Palm* 23 Dæmonorops mela ol p s *Mart Hist N t P l* iii 1 t 175 f xi, 312 *under* C li icus *and* t l 116 f xi *W lp Ann* iii 481 and 829

NILGHIRI HILLS; alt 5-6000 ft at S sp ral *Wight &c* at Naduvatam *Ga* e

Apparently a stout scandent species *Leaflets* 12–16 by ⅜ 1 in, tips spinelosely ciliate, margins below obscurely aculeolate pale green 1 or shining, almost white b neath, the very distant bristles on the lateral nerves bene th sometimes absent at others nearly ½ in long rachis and petiole pale *Fruit* ¾ in diam very shortly beaked, scales subacute with fimbriate margins not channelled, fruiting calyx nearly ¼ in diam, petals acute

43 **C. Gamblei,** *Becc mss* leaflets as in *C Huegelianus* but with shorter scattered bristles on the 3 costæ of the lower surface and a few on the upper, fruiting spikes of the spadix recurved calyx cupular long pedicelled, lobes very short, fruit globose or broadly obovoid, scales pale yellow acute deeply channelled

–½ ft, which variety

with spherical fruit is mentioned by Beccari

Group VII See p 438

44 **C. gracilis,** *Roxb Fl Ind* iii 781 (*excl Syn Hort Mal*), leaflets few in opposite groups of 3–5 on each side of the slender rachis elliptic lanceolate acuminate 3–7 costate costæ very slender more or less setose

t 51 C, *For Fl* ii 520

The Khasia Hills ascending to 4000 ft, Upper Assam, *Mann* Cachar, *Keenan*, Chittagong *Kurz*

Slender, s ander t n ike t stem not thicker than a quill *Leaves* 2–3 ft, leaflets 5–7 in, margins obscurely bristly except at the tip where the bristles are long, petiole very short and rachis ft gaci u ly scurfy, sheaths green, gla rous *Spathes* fugaciously brown scurfy, spath l unarm l *Corolla* three times as long as the calyx *Fruit* ¾ in long scales straw col l with or without a narrow brown border, fruiting calyx pedicelliform *Seed* wrinkled —Descript chiefly from Kurz

45 **C. melanacanthus,** *Mart Hist Nat Palm* iii 333, t 116, f 13 (*in part*), leaflets many equidistant
3 costate upper much shorter, shortly
rachis with a single row of short rec
whorled spines, fem spadix decom

iked, scales very pale
Griff in Calc Journ
iii 481, v 8 0, *Miq*
rz in Journ As Soc

nak
gre

deeply ruminate; embryo in the middle of the side, a very unusual position in the genus.—The specimens examined are of the portion of a leaf and of a fruiting spadix.

46. **C. Diepenhorstii,** *Miq. in Journ. Bot. Neerl. Ind.* i. 21; *Palm. Archip. Ind.* 27; *Fl. Ind. Bat.* 594, leaflets very many equidistant long narrow finely acuminate 3-costate, costæ naked or very sparsely setose above, margins thickened smooth, petiole very long armed with straight ... one row above and two below ... armed with long flat straight ... supradecompound, fruiting calyx ... shortly beaked, embryo basal. ... *Cat.* 8606 A.

PENANG, *Wallich, Curtis* (763). PERAK, on Gunong Tambang Batok, alt. 500–2000 ft. *Scortechini* (647b). Larut and Gunong Malacca, *King's Collector* (7201, 2552).—DISTRIB. Sumatra.

Stem 20–30 ft., stout, scandent. *Leaves* 3–4 ft., leaflets 18–20 by ¾–⅚ in., straight, upper smaller, spines of sheath ½–⅔ in. long. *Fruiting spadix* 10–12 ft., slender. *Fruit* ¾ in. diam., orange-yellow when ripe (King's collector), fruiting ...

?47. **C. singaporensis,** *Becc. mss.*, leaflets many rather distant narrowly linear finely acuminate 3-costate, tips setose, margins and costæ ... upper part of rachis slender angled ... male spadix very slender ... tubular lower shortly ... with oblique membranous ... icate short striate, flowers very young.

SINGAPORE, in the forest near the Bot. Garden, *Murton*.

Apparently a very slender species of doubtful position, known only by an upper portion of a leaf and young male spadix. *Leaflets* 10–12 by ⅓–½ in., margins hardly thickened.

GROUP VIII. See p. 438.

48. **C. exilis,** *Griff. Palms Brit. Ind.* 51 (axilis, 35), leaflets many ... finely acuminate copiously setulose on the margins ... urfy ... ened ... med ... with short straight flattened spines ... all over as are the spathes, fruit linear oblong sharply beaked. *Mart. Hist. Nat. Palm.* iii. 333, t. 176, f. 7; *Walp. Ann.* iii. 484, v. 830; *Miq. Fl. Ind. Bat.* iii. 116.

MALACCA, on Gunong Ladang, *Fernandez*. PERAK, Larut and Ulu Bubong, alt. 4000 ft., *Scortechini* (657b), *King's Collector* (2734, 6215, 8157) 10,259, *Herb. Calc.*).

Stem 15–20 ft., ½ in. diam. *Leaves* 3–3½ ft.; leaflets 8–10 by ⅓–½ in., cross ...

Branches of fem spadix 6–8 in , coarsely scabrid, bearing short alternate few-fld spikes, fruiting calyx pedicelled and pedicelliform, campanulate, lobes as long as the tube and as the petals *Fruit* nearly 1 by ⅓ in diam dirty yellow, scales margined with brown *Seed* linear oblong, transversely grooved, albumen not ruminate; embryo in the middle of the back.

GROUP IX See p 438

49 **C. tomentosus,** *Becc mss* , sheath, rachis and flagellum softly almost flocculently white tomentose, leaflets few distant or in distant pairs elliptic acuminate coriaceous strongly nerved, margin crisped or waved

PERAK *Scortechini* (431b), alt 2500–3000 ft , *King's Collector* (5332, 6993)

Stem 20–40 ft , ½–¾ in diam , light grey *Leaves* 2–3 ft , leafl ts 8–14 by 3–6 in , base narrowed, green on both surfaces or yellowish beneath with brown stripes above, nerves flabellate, sheath unarmed, ochrea annular very coriaceous, acute posteriorly, petiole short, very stout, subterete armed with few distant 3 fid short claws, flagellum 8–10 ft , ending in a long filiform prickly tip armed with strong 3-fid claws at about equal distances, towards the base the surface of the petiole is granulate when dry. A portion of a flowerless and fruitless spadix is terete with tubular spathes and bears distant spreading spikes 4 in long, with rather distant coriaceous subcampanulate spathels —A remarkable plant of which the specimens are very imperfect The description of the stem and colour of the leaflet is from notes by King's Collector, the rest from his specimens, one of which (5332) with smaller leaves is from Larut, "within 300 ft ," perhaps meant for 3000 (as in n 6993)

GROUP X. See page 438

50 **C. zeylanicus,** *Becc mss* , leaflets many long equidistant ensiform long acuminate –5 costate, margins minutely setulose or naked, costæ very sparingly set se above naked beneath, rachis very stout, male spadix decompound lower spathe acute armed with very short scattered prickles, upper striate smooth or sparsely aculeate, uppermost funnel shaped truncate, branches of male spadix 6–10 in clothed with short broad imbricate spathels spikelets very many distichous, spathellules extremely short and densely imbricate fem spikes and spikelets much longer and laxer, fruit globose long beaked C rudentum, *Thw Enum.* 330 (*excl. syn.*) (*non Lour*), *Hance in Journ Bot* 1874, 262

albumen deeply ruminate, embryo lateral

51. **C. latifolius,** *Roxb Fl Ind* iii 7751; leaflets few large scattered or 2-nate elliptic or elliptic lanceolate 3–9 costate tips setose, margins aculeolate, costæ naked on both surfaces, rachis flagelliferous very stout variously armed with scattered spines, sheath densely covered with very short broad whorled spines and a few very large straight flat solitary or whorled ones, spadix decompound, spathes short subcompressed sparsely

spinous mouth oblique spathels short, male spikes densely imbricate, fruiting calyx sessile, pedicelliform broadly campanulate lobes short, fruit subglobose pale *Mart Hist Nat Palm* iii 339, t 160, f 3 *Griff in Calc Journ Nat Hist* v 60, *Palms Brit Ind* 68 t 198 (*excl cit Hort Malab*), *Kurz in Journ As Soc Beng* xliii ii 210 (*excl* t 31 A), *For Fl* ii 518 (*partim*) C macracanthus et inermis, *T Anders in Journ Linn Soc* xi 10, 11, ? C humilis, *Roxb Fl Ind* iii 773

From the SIKKIM HIMALAYA and ASSAM, ascending to 2000 ft, to TENASSERIM

Stem stout, 1–2 ft as thick as the thumb *Leaves* with the flagellum 10–15 ft; leaflets 1 2 ft by 1–2½ in, upper sometimes flabellately clustered or connate at the base cross nervules very many and close, petiole short or long, sometimes bearing the leaflets only far up the flagellum, base sometimes ¾ in broad, smooth, b convex, spines very various always scattered *Spadix* very large, spathes and branches usually armed with scattered very short broad spines *Fruit* (not quite ripe) nearly 1 in long rather narrower pale dull yellow, scales convex, deeply channelled, shining, margin very narrowly scarious —*C humilis*, Roxb is probably founded on a very young plant of *C latifolius* with undeveloped flagella

52 **C. Doriaei,** *Becc mss*

BURMA, on Mt Karin *L Fea*

Only a portion of a spadix with fruit known It appears to be nearly allied to *C latifolius*, from which it is distinguished by the elongate fruit ¾–1 by ½ in — I have seen no specimen *J D H*

53 **C. simplex,** *Becc mss*, leaves flagelliferous leaflets very few large elliptic 3–6 costate, spadix supra axillary quite simple elongate not flagelliferous bearing at every primary spathe a solitary simple spikelet or at most two from the lowest spathe, fruiting calyx callous shortly pedicelliform fruit rather large broadly ovoid, seed globose, albumen deeply ruminate, embryo subbasilar

PERAK on Gunong Tambang Batak *Scortechini* (432)

Differs from all other known species in the few divisions of the spadix.—I have seen no specimen *J D H*

54 **C. caesius,** *Blume Rumph* iii 57, leaves subsessile flagelliferous, leaflets very inequidistant in distant fascicles of 5–7 oblanceolate cuspidately acuminate glaucous or farinose beneath acutely ¾ costate above and setulose, margins setulose acute rachis armed with solitary and sub whorled spines, sheath not flagelliferous very gibbous above fugaciously scurfy armed with scattered long horizontal spines with broad callous bases and small acute tubercles *Mart Hist Nat Palm* iii 340, *Walp Ann* iii 490, v 832 *Miq Anal Bot Ind* i 6, *Fl Ind Bat* iii 129, *Palm Archip Ind* 28 C glaucescens, *Blume, l c* 65, *Mart l c* 339, *Walp ll cc* 489, 830, *Miq ll cc*

PERAK, *Scortechini* —DISTRIB Borneo

A lofty climber *Leaves* 2–3 ft., leaflets 12 14 by 2–2½ in *Fruit* unknown — Appears to be allied to *C melanoloma* of Java. I have seen no specimen *J D H*

55 **C. axillaris,** *Becc mss*, leaves shortly petioled, leaflets numerous very inequidistant above oblanceolately ensiform margins smooth, rachis unarmed below armed above with scattered simple and ternate claws, spadix not flagelliferous elongate with several erect partial inflorescences, spathes 1st and 2nd fugaciously scurfy unarmed or the lower scarcely armed,

spikelets short scorpio d 3rd spathe infund bular l mb op n truncate marg n fimbr ate spathels and spathellules str ate marg ns ciliate flowers disticho is calyx finely striate

PERAK *Scortech n*

D sc ib d fro n a s ngle spec men wl l I have not seen Ile f u t and l ence the pos t on of the spec e s unknown *J D H*

56 **C pallidulus** *Becc mss* leaves subsess le leaflets inequ d stant hardly fasc cled ens form acumin ite costæ 3 unarmed on both surfa es marg ns sparsely sp nulose racl s strong y arme l with un form short bla k t pped 3 fid claws sheath wit scattere l short stra ght sp nes spathes armed with short stout scattered simple con cal sp es fruit spl erical shortly beaked pale seed deeply p tted albumen ruminate

PERAK at Tl p ng *W ay* (239? 3017)

Leaflets 8–10 n The upp r spa l es re nak d w th m ch d l ted obl quely truncate mouth The fem s; ke ? 2½ n s r ly recu ve l sp t e s st gly mur cate *Fru t* ⅔ n d m very pale sc les ob cu ely l ann lle l g us hardly sear ou beak cyl nd c tru t calyx ped ce l form D c b d fro n t o leaves a small port on of a sheath a f ag n nt of spad x w th i e f u t

GROUP XI See p 438

* *Fruiting periantl not pedicell form*

57 **C ovoideus,** *Tl v ex Tr nen in Journ Bot* 1885 269 leaves

beaked

CEYLON Saff gam d str ct *Thwa tes* (CP 39?)

lu l n the fla llum leaflets *I u t* ⅞ ½ n long strongly lled narrowly ma g ned w th

58 **C andamanicus** *K r in Journ As Soc Beng* xl n. n 211,

t long mucronate tips

ANDAMAN and NICOBAR ISLANDS *Kurz Man*

Stem l fty scandent as tl k as tl e arm (w th the sheaths on) *Leaflets* ? ?½ ft. by 1 in broad *Fruit* d st chous un formly brown abo it ½ in long sc les rl o bo d green h bordered w tl chesnut b own rather flat not furro ve l t ps pro lo g d n o a lanceolate pale h o t opaque acute c l ol te membranous appendage lo ger than the scal itself *Seed* semiconvex grooved; albumen equable —(The above from Kurz)

spinous mouth oblique, spathels short male spikes densely imbricate, fruiting calyx sessile, pedicelliform broadly campanulate lobes short, fruit sub globose pale *Mart Hist Nat Palm* iii 339, t 160, f 5 *Griff in Calc Journ Nat Hist* v 60, *Palms Brit Ind* 68 t 198 (*excl cit Hort Malab*), *Kurz in Journ As Soc Beng* xliii ii 210 (*excl* t 31 A), *For Fl* ii 518 (*partim*) C macracanthus et inermis, *T Anders in Journ Linn Soc* xi 10 11, ? C humilis, *Roxb Fl Ind* iii 773

From the SIKKIM HIMALAYA and ASSAM, ascending to 2000 ft, to TENASSERIM
Stem stout, 1-2 ft as thick as the thumb *Leaves* with the flagellum 10-15 ft, leaflets 1 2 ft by 1-2½ in upper sometimes flabellately clustered or connate at the base, cross nervul s very many and close, petiole short or long, sometimes bearing the leaflets only far up the fl gellum base sometimes ¾ in broad, smooth b convex, spines very various always scattered *Spadix* very large, spathes and branches usually armed with scatte ed very short broad spines *Fruit* (not quite ripe) nearly 1 in long rather narrower, pale dull yellow, scales convex, deeply channelled, shining, marg n very narrowly scarious —C *humilis*, Roxb, is probably founded on a very young plant of C *latifolius* with undeveloped flagella

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BURMA, on Mt. Karin *L Fea*
Only a portion of a spadix with fruit known It appears to be nearly allied to C *latifolius*, from which it is distinguished by the elongate fruit ¾-1 by ½ in — I have seen no specimen *J D H*

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PERAK, on Gunong Tambing Batak *Scortechini* (432)
Differs from all other known species in the few divisions of the spadix —I have seen no specimen *J D H*

54 **C. caesius,** *Blume Rumph* iii 57, leaves subsessile flagelliferous, leaflets very inequidistant in distant fascicles of 5-7 oblanceolate cuspidately acuminate glaucous or farinose beneath acutely 4 costate above and setulose margins setulose acute rachis armed with solitary and subwhorled spines, sheath not flagelliferous very gibbous above fugaciously scurfy armed with scattered long horizontal spines with broad callous bases and small acute tubercles *Mart Hist Nat Palm* iii 340, *Walp Ann* iii 490, v 832, *Miq Anal Bot Ind* i 6, *Fl Ind Bat* iii 129, *Palm Archip Ind* 28 C glaucescens, *Blume, Ic* 65, *Mart l c* 339, *Walp ll cc* 489, 830, *Miq ll cc*

PERAK, *Scortechini* —DISTRIB Borneo
A lofty climber *Leaves* 2-3 ft; leaflets 12 14 by 2-2½ in *Fruit* unknown — Appears to be allied to C *melanoloma* of Java I have seen no specimen *J D H*

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spikelets short scorpioid, 3rd spathe infundibular, limb op^n truncate margin fimbriate spathels and spathellules striate margins ciliate flowers distichous calyx finely striate

PERAK, *Scortechini*

Described fro n a single spec men which I have not seen The f uit, and hence the pos t on ot the species is unknown *J D H*

56 **C. pallidulus,** *Becc mss* leaves subsessile leaflets inequidistant hardly fascicled ensiform ac iminate costæ 3 unarmed on both surfaces margins sparsely spinulose rachis strongly arm d with uniform short black tipped 3 fid claws sheath with scattered short straight spines spathes armed with short stout scattered simple conical spines, fruit spherical shortly beaked pale, seed deeply pitted albumen ruminate

PERAK at Thaip ng *W ay* (2392 3017)

Leaflets 8–10 in The upp r spa hes are naked with much dil ited obl quely truncate mouths The fem spikes 2 2½ in str ngly recurved, spathels str ngly muricate *Fruit* ¾ in diam very pale scales ob curely channelled margins hardly scarious beak cyl ndric fru ti g calyx ped cell form —De cribed from two leaves, a small portion of a sheath, a fragment of a spadix with ripe fruit

GROUP XI See p 438

* *Fruiting perianth not pedicelliform*

57 **C. ovoideus,** *Thw ex Trimen in Journ Bot* 1885 269, leaves

beaked

leaflets strongly ed with

58 **C. andamanicus,** *Kurz in Journ As Soc Beng* xliii ii 211 t xxvii A, xxviii , *For Fl* ii 519, leaflets alternate equidistant line of subulate acuminate 3 costate, margins thickened and costæ setose, petioles and rachis armed with stout recurved spines, petiole with blackish tub long based ones mixed with long black spines, sheath red brown covere Malacca,

Palms o at the 9 costate

ANDAMAN and NICOBAR ISLANDS *Kurz, Man*

Stem lofty scandent as thick as the arm (with the sheaths on) *Leaflets* slender by 1 in broad *Fruit* distichous uniformly brown, abo it ½ in long, sc slender boid, greenish bordered with chesnut brown, rather flat, not furrowed tubercles, longed into a lanceolate pale brown opaque acute ciliolate membranou *Miq Fl* longer than the scale itself *Se d* semiconvex, grooved, albumen e above from Kurz)

spinous mouth oblique, spathels short, male spikes densely imbricate, fruiting calyx sessile, pedicelliform broadly campanulate lobes short fruit sub globose pale *Mart Hist Nat Palm* iii 339, t 160, f 5 *Griff* in *Calc Journ Nat Hist* v 60, *Palms Brit Ind* 68 t 198 (*excl cit Hort Malab*), *Kurz* in *Journ As Soc Beng* xliii ii 210 (*excl* t. 31 A), *For Fl* ii 518 (*partim*) *C macracanthus et inermis*, *T Anders* in *Journ Linn Soc* xi 10 11 ? C humilis, *Roxb Fl Ind* iii 773.

From the SIKKIM HIMALAYA and ASSAM ascending to 2000 ft, to TENASSERIM *Stem* stout 1 2 ft as thick as the thumb *Leaves* with the flagellum 10 15 ft; leaflets 1 2 ft by 1–2½ in upper *sometimes* flabellately clustered or connate at the base cross nervules very many and close, petiole short or long, sometimes bearing the leaflets only far up the flagellum base sometimes ¾ in broad, smooth b convex, spines very various always scattered *Spadix* very large spathes and branches usually armed with scattered very short broad spines *Fr* it (not quite ripe) nearly 1 in long rather narrower, pale dull yellow, scales convex deeply channelled shining margin very narrowly scarious —*C humilis* Roxb is probably founded on a very young plant of *C latifolius* with undeveloped flagella

52 **C. Doriaei,** *Becc mss*

BURMA on Mt. Karen *L Fea*
Only a portion of a spadix with fruit known It appears to be nearly allied to *C latifolius*, from which it is distinguished by the elongate fruit ¾ 1 by ½ in.—I have seen no specimen *J D H*

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PERAK on Gunong Tambang Batak *Scortechini* (432)
Differs from all other known species in the few divisions of the spadix —I have seen no specimen *J D H*

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PERAK *Scortechini* —DISTRIB Borneo
A lofty climber *Leaves* 2–3 ft; leaflets 12 14 by 2–2½ in *Fruit* unknown —Appears to be allied to *C melanoloma* of Java. I have seen no specimen. *J D H*

55 **C. axillaris,** *Becc mss* leaves shortly petioled leaflets numerous very inequidistant above oblanceolately ensiform, margins smooth, rachis unarmed below armed above with scattered simple and ternate claws, spadix not flagelliferous elongate with several erect partial inflorescences, spathes 1st and 2nd fugaciously scurfy unarmed or the lower scarcely armed,

beneath petiole long stoutly arme' ' '' . ' ' '
seriate straight or deflexed spines ε
Arch p Ind 17 *with fig* C Fern
236 Dæmonorops fasciculatus Mc
Ann m 480 v 829 *M Fl Ind Bat* m. 101 —Rotang Pajare, *Griff in Calc Journ Nat Hist* v 89, *Palms Brit Ind* 95

MALACCA *Fernandez Orle*; —DISTRIB Banca?
Stem with the sheaths about 1 in diam *Leaves* 10–11 ft long exclusive of the long flagellum, leafl ts 1 ft by ¾ in petiole about 2 ft, its lower part armed like the sheath, sheath with a very oblique mouth —Descript from Griffith

GROUP XII See p 438

64 **C. Martianus,** *Becc mss* —*C paniculatus,* Mart Hist Nat Palm m 334 (not of Roxb)

PENANG, *Gaudichaud*
Stem scandent *Leaflets* 4 5 in, equidistant, alternate, lanceolate, tip shortly acuminate and bristly 7 9-costate margins and surfaces unarmed petiole very short, rachis and slender flagellum armed with short spines, sheath with a short obliquely truncate ochrea *Male spadix* decompound, lower spathes subterete faintly 2 keeled and rachis armed with short scattered spines, upper unarmed spikes slender spreading equalling or twice as long as their spathes —Description from Martius, neither Beccari nor have I seen specimens —*J D H*

65 **C. spathulatus,** *Becc mss*, leaflets very few alternate distant uppermost pair connate at the base elliptic obtuse convex above, costæ 5–9 and margins quite smooth, petiole very short and slender, rachis copiously armed with large solitary and 2–3 nate recurved black-tipped spines, sheath flagelliferous elongate cylindric copiously armed with uniform short straight conical based spines fem. spadix slender flagelliferous, spathes slender terete armed with short hooked spines, fruiting calyx pedicelliform short contracted sessile, base broadly truncate, fruit (young) long beaked very pale

MALACCA, *Lobb, Hervey*
Stem scandent; very slender *Leaves* probably 2–3 ft long leaflets 4–7 by

66 **C. insignis,** *Griff in Calc Journ Nat Hist* v 58, *Palms*

Mart Hist Nat Palm m 333, *Walp Ann* m 480, v 831, *Miq Fl Ind Bat* m 128

59. **C. palustris,** *Griff in Calc Journ. Nat. Hist* v 62, *Palms Brit Ind* 71, t. 194, leaves shortly petioled, leaflets alternate the median approximate in pairs broadly elongate-lanceolate acuminate with bristly tips 3-costate and many nerved, margins not thickened and costæ smooth, petiole with 1–2 rows of short very broad fascicled or simple hooked spines with swollen bases, sheath green sparingly armed with short black or broad hooked spines, spathes tubular obliquely truncate armed with recurved spines spathels glabrous, fruiting perianth stellate, fruit ellipsoid oblong, scales obtuse *Mart Hist Nat Palm* iii. 339. *Miq Fl Ind. B* iii. 101, *Walp Ann* iii 499, v 831. C latifolius, *Kurz (not Roxb)* in *Journ As Soc Beng* xliii. ii. 210, t. 31 A, *For. Fl.* ii. 518 (*partly*)

TENASSERIM *Griffith.* PERAK, *Scortechini* (5 ?). ANDAMAN ISLANDS, *Kurz, Man.*

Stem scandent everywhere glabrous, with the sheaths on 2–3 in. diam. *Leaves* 8–12 ft., leaflets 1–2 ft by 3–5 in, rather thin, uniformly green. *Spadix* bifariously decompound elongate, drooping *Fruit* about ½ in. long, scales slightly concave hardly channelled, pale brown with a blackish border *Seed* almost semi-convex, grooved and irregularly wrinkled.—(Descript. from Kurz)

** *Fruiting perianth more or less pedicelliform.*

60 **C. unifarius,** *H Wendl in Bot. Zeit.* xvii. (1859) 158, var Pentong, *Becc mss*

NICOBAR ISLANDS *E H Man*

The plant referred as above consists of a leaf and a portion of a spadix with the fruit wanting *C unifarius* is a Javan plant, described as having rather few inequidistant lanceolate or oblong-lanceolate acuminate 7-costate leaflets; the fruit is subglobose about ? in diam, with channelled scales and deeply sinuately furrowed seeds with a basal embryo —I have seen no specimen. *J D H*

61 **C neglectus,** *Becc mss*

MALACCA *Griffith* (Kew Distrib 6399 bis).

This species is founded in the flagelliferous apex of a leaf and a portion of a fruiting spadix The flagellum is very slender, the leaflets subequidistant, 4–6 in. by ⅓ in, membranous, linear lanceolate finely acuminate, setaceous pointed, with 3 slender costæ and thickened setose margins, spathes coriaceous, tubular, obliquely truncate, armed with short scattered straight stout spines, fruiting calyx subpedicelliform, with broad spreading obtuse lobes, young fruit ¼ in long, ellipsoid, scales sc dull pale yellow with broad scarious brown margins and tips, not channelled beak wholout —I have seen no specimer *J D H*

scurfy

62 **C viridispinus,** [illegible] leaflets in very [illegible] with [illegible] elon[illegible] wers, [illegible] etals

Appears to [illegible] bumen solid

J D H. [illegible], *Scortechini* (316b), at Larut, alt 3500–4000 ft. (*Herb Calcutt* 4127)

0–25 ft *Leaves* bright green, leaflets 10 by nearly 1 in —I have seen

55 **C. a**[illegible]gment of a leaf, from Larut, and a spike of very young fruit *J D H*

very inequi[illegible]

unarmed be[illegible] **Oxleyanus,** *Teysm & Binnend Cat Pl. Hort Bogor* 1866, spadix not fla[illegible]ly) erect, leaflets very many in subopposite distant fascicles spathes 1st and [illegible]ate acuminate, tip bristly, costæ 5 setose above naked

beneath, petiole long stoutly armed sheath excessively armed with large seriate straight or deflexed spines and scattered short ones *Miq Palm Archip Ind* 17, *with fig* C Fernandezii *H Wendl in Kerchov Palm* 236 Dæmonorops fasciculatus *Mart Hist Nat Palm* iii 330, *Walp Ann* iii 480 v 829 *Miq Fl Ind Bat* iii. 101 —Rotang Pajare, *Griff in Calc Journ Nat Hist* v 89, *Palms Brit Ind* 95

MALACCA *Fernand* *Oxley* —DISTRIB Banca?
Stem with the sheaths about 1 in diam *Leaves* 10–11 ft long exclusive of the long flagellum, leaflets 1 ft by ¾ in petiole about 2 ft, its lower part armed like the sheath, sheath with a very oblique mouth —Descript from Griffith

GROUP XII See p 438

64 **C. Martianus,** *Becc mss* —*C paniculatus*, Mart Hist Nat Palm iii. 334 (not of Roxb)

PENANG, *Gaudichaud*
Stem scandent *Leaflets* 4 5 in, equidistant alternate lanceolate tip shortly

65 **C. spathulatus,** *Becc mss*, leaflets very few alternate distant uppermost pair connate at the base elliptic obtuse convex above, costæ 5–9 and margins quite smooth, petiole very short and slender,

calyx pedicelliform short contracted sessile, base broadly truncate, fruit (young) long beaked very pale

MALACCA, *Lobb Hervey*
Stem scandent, very slender *Leaves* probably 2–3 ft long, leaflets 4–7 by

cylindric beak, scales very pale straw cold, faintly channelled ... with
Var *robusta*, Becc, spadix much larger, very stout —Perak, Geelong decom
King's Collector (7136) ... solitary
... e, scales

66 **C. insignis,** *Griff in Calc Journ Nat Hist* v 5... *Brit Ind* 69, leaflets few distant alternate uppermost pair conn...

Ind Bat iii 128

MALACCA, *Fernandez* PERAK, *Scortechini*
Stem scandent, as thick as a goose quill, shining; internodes 2 in. *Leaves* 12–18 in.; leaflets 3–6 by 1–1½ in., polished above, cross-nervules very many and ... set; petiole 3–5 in.; sheath not so thick as the little finger, very long,

nerves *J D H.*

67. **C. quinquenervius,** *Roxb Fl Ind* iii 777, scandent, leaves flagelliferous, leaflets alternate remote equidistant narrowly lanceolate, spines in belts slender, fruit spherical *Kunth Enum* iii 209, *Mart Hist Nat Palm* iii 339, *Griff. in Calc Journ Nat Hist* v 61, *Palms Brit Ind* 72

SILHET, *Roxburgh*
Climbing *Stem* exclusive of the leaf-sheaths, about as thick as the middle finger, internodes 6 8 in—Probably a well-known species, but not identifiable by the character given, nor recognized by Beccari or myself

68 **C. ornatus,** *Blume in Rœm & Sch Syst* vii ii 1326, *Rumphia*, iii t 148, *Mart Hist Nat Palm* iii 208, t 116, f 2 —
... leaves petioled not flagelliferous, leaflets large ... e glaucous beneath, margin ... and rachis shortly armed, ... long flagelliferous, spathes ... tubular armed with very long spines, branches few erect, spathels smooth, male spikes close set recurved very stout, spathellules broadly imbricating. C ornatus, *Griff in Calc Journ Nat Hist* v 37 *Palms of Brit Ind.* 46; *Miq. in Journ Bot Neerl Ind* i 21, *Fl Ind Bat Suppl.* 256. C. ovatus and C aureus, *Reinw ex Mart l c* 203 241

MALACCA *Fernandez* PERAK, *Scortechini* (587b) (*Herb Calc* 3931) — DISTRIB Malayan Islands
Stem robust, 50–80 ft, 1½ in diam without the sheaths, sheaths about 2 in. diam. *Leaves* 12–15 ft, leaflets 2–2½ ft by 2½ in broad, tip rather obtuse often 2 fid, bristly; mid costa above with stout bristles towards the tip, petiole 3 ft, 1½ in diam, somewhat flattened, rusty-pubescent, much armed with broad strong flattened spines ¾ in. long, sheath copiously armed with whorled flat appressed

...

69 **C. giganteus,** *Becc mss*, very robust, leaves large flagelliferous, leaflets many equidistant broadly ensiform acuminate plicately sub 5-costate, costæ and margins unarmed petiole long and rachis armed with short spines, sheath very stout woody smooth densely armed with very broad basal flat long scattered or subseriate spines and short scattered ones, male spadix supradecompound, branches close together, spathes tubular shortly spiny, fruiting calyx pedicelliform, fruit large ellipsoid-ovoid, acute

PERAK *Scortecl*
Alp ntly sc n len leaf he th ? 3 n d am *Lea es* 8 1) ft long pet ole 3 f leafl ? f by 1½ *F t* ove a ch lo g s ddenly contracted into a cunc l po n s ale n a o d—V ry near *C ornatus* b t more rot n t a l nor d u l o l a u lantly d t ct n the non flagell ferous spa l x longer branches and a m d se o dary spathes I have seen no spec men *J D H*

70 **C scipionum,** *Lour Fl Co h ch* 210 leaves not flagelli elongate d on both h upper very stout

mammillate brown *Lam Ency l Hist Nat Pal n* 11 342 *Kunth* v 832 *Gr ff in Calc Jo rn Nat H st* v 35 *Palms Br t Ind* 43 *Miq Fl Ind Bat* 11 138 *C m cranth is Blume Rumpl* 11 53 (*leaf onl y*) t 157 (*excl spadix & anal fl*)—Ching *Gr ff l c c* 37 and 46

MALACCA *Gr ffith* PERAK *Scortecl ini* (501[b]) at Gunong Malacca *King s Collector* (7171 —DISTRIB Bo neo
Stem 40–60 ft st at 3 d am *Lea es* 4 5 ft flagellum 10 12 ft larger

spathellules and bracts very s ort nu t n s d d yu snu broadly urc ol e ba e tru cate nt uded moutl much contracted lobes very sl ort pet ls at er l nger b o lly ov t *F u t* (youn) n long scales brown sl n tum d l ly l au elle l w th broad pale s ar ous mar us *Seed* (young) sub-obovo d alveo ate embryo bas lar

GROUP XIII See p 438

71 **C conirostris,** *Becc* n ss leaf long pet oled shortly flagelli ferous leaflets numerous equid stant narrowly ensiform t ps slender strongly setulose co ta 3 n ore or less setulose above the median only beneath rach s and flagellum armed with stout recurved 3 5 fid claws petiole very stout margins densely armed with subsol tary stout stra ght erect and spread ng sp nes sheath armed with very long and slender sp nes spatl es cop ously armed w th subseriate straight spines fem sp d x very stout spatl els densely sp nous spikes very sl ort and stout bracts large dens ly 1 nb icate cupular fl large fruit narrowly ovo d narrowed into a stout beak black

PERAK at Gop ng alt 500–1000 ft *K ng s Collector* (1593 5808)
Stem 15 20 ft 1 1½ n d a *L a es* 6 8 ft glo sy l fl ts 10–18 ft by

Seed o o l rougl lbu c ca cellate tl ro ghout

... shortly 3-toothed. *Fem. spadix* very stout, scurfy, ... *Flowers* shortly pedicelled, calyx striate; petals ... Seed erect, abounding in dragons' ... the size of a large marble ... embryo basilar.—Descript. chiefly from Griffith l.c.

D. geniculatus... Mart. Hist. Nat. Palm. iii. 204, t. 177, f. 11, ... very many and narrow equidistant linear tip filiferous, ... costa above bearing long bristles and a few on the ... sheath armed with long flat spines, outer spathe ... beak as long as the body dorsally armed ... *Miq. Fl. Ind. Bat.* ... hilus, *Griff. Palms* ...

... PERAK, *Scortechini*.

... *Leaflets* 12 by ¾ in., petiole forming a thick ... armed with scattered spines below and with stout ... the sheath ... on the rachis young rusty woolly. *Spadix* nearly 2 ft. ... 2-keeled, inner unarmed.—Descript. from Griffith. I have seen no ... J. D. H.

D. angustifolius, *Mart. Hist. Nat. Palm.* iii. 329, leaves shortly ... very many narrow and close set equidistant narrowly ...

... armed with scattered ... armed ... sheaths, spadix thyrsiform scurfy. *Miq. Fl. Ind. Bat.* iii. 89, ... iii. 476, v. 827. Calamus angustifolius, *Griff. in Calc. Journ. Nat. Hist.* v. 89, *Palms Brit. Ind.* 95, t. 213 A. B.

MALACCA, *Griffith*.

... *Leaves* 5–5½ ft., flagelliferous, leaflets 8–10 by ½–¾ in.; petiole ... *Outer spathe* about 1½ in. long, the beak half its length, flat, 2nd spathe ... e, branches ... ique, calyx ... Griffith, who ... how he dis... ves only of ... and closely ...

... Hist. v. 83, *Palms Brit. Ind.* 93, t. 211 A, B.

MALACCA, *Fernandez*. PERAK, *Scortechini*, *King's Collector* (7135).

Stem 15–20 ft., ¾ in. diam. *Leaves* 4–5 ft.; leaflets 18–20 by 1–1½ ins., membranous, dark green, median costa stout, lateral very slender; rachis ½ terete, sparingly armed; petiole 1 ft. *Outer spathe* 18 in., beak twice as long as the body. *Spadix* ... *Fruit* ¾ in. diam., suddenly contracted into a narrow beak; scales yellow, obscurely channelled; fruiting calyx not pediciliform, broadly 3-lobed; petals much

longer, linear. *Seed* globose, muriculate, albumen foveolately ruminate —Griffith says "with difficulty distinguishable from *grandis*, and chiefly by the very slender more numerous deflexed spines of the spathe"

8 **D. Sepal,** *Becc mss*, leaflets rather numerous equidistant narrowly linear finely acuminate setulose on the 3 costæ above and margins, rachis armed with 3-fid claws, petiole dorsally compressed armed with ned spines, sheaths with subnes, outer spathes long beaked ter clustered spines, fruiting

PERAK alt 3–4000 ft, *King's Collector* (4133), on Gunong Tambang, *Scortechini* (433b)

Stem 20–30 ft, ½–¾ in diam *Leaves* 6 8 ft, leaflets 8 12 by ½–¾ in, spines of sheath ¾ in long, mixed at the juncture with the petiole with more slender shorter black ones *Fruit* ¾ in long, abruptly beaked light brown, glossy, scales deeply channelled, margins brown, fruiting calyx pedicelliform, lobes broad, petals twice as long

9 **D. Pseudosepal,** *Becc mss*, leaflets not numerous very long and narrow setiferous on the 3 costæ above and median beneath, petiole with scattered very short spines except at the base where longer and more slender, sheath with very long elastic flat seriate spines, mouth nearly naked, fem spadix short, fruit globose with a short broad mucro

PERAK, alt 300 ft, *King's Collector* (7975) *Scortechini*

Stem 10 15 ft, nearly ¾ in diam *Leaves* 3–4 ft, leaflets inequidistant, dark green, ½–¾ in broad, petiole 16 18 in, armed on the back and margins *Fruit* ¾ in diam, pedicelled, dirty yellow, scales few, channelled, margins narrowly scarious, tips discoloured, fruiting calyx not pedicelliform —Affinity doubtful from want of spathes

10. **D. Lewisianus,** *Mart Hist Nat Palm* 327, t 175 f iv, leaflets

black flat spines, outer spathe shortly beaked armed with weak deflexed long black spines, inner with 2 rows of slender spines, spadix as in *D intermedius*, but branches more slender and less scurfy, fruiting spadix erect, fruit spherical Calamus Lewisianus, *Griff in Calc Journ Nat Hist* v. 87, *Palms Brit Ind* 94, t 212 A

PENANG, *Lewis*

Stem scandent with the sheaths about 1 in diam *Petiole* about 1 ft, base much swollen and then armed with scattered short deflexed spines, and above with spines 1½ in long, leaflets 13 15 by ¾ 1 in *Outer spathe* 3 9 in, peduncle armed with flat spines, beak one third the length of the body *Male* and *fem spadix* as long as the spathe, flowers scurfy, males most so *Male calyx* obtusely toothed, margins bearded, fruiting petals twice as long *Fruit* pale yellowish; scales in 15 rows, blackish towards the margin —Descript chiefly from Martius and Griffith.

** *Stems erect or subscandent, upper leaves alone with flagella*

11. **D. monticolus,** *Mart Hist Nat Palm* iii 328, t 175, f v. leaves petioled, leaflets equidistant alternate linear subulate acuminate, costæ 3 all bristly above naked beneath except the median at the apex,

margin bristly, rachis unarmed, petiole armed with stout hooked spines, sheaths scurfy armed with long flat black deflexed seriate spines outer spathe long beaked dorsally armed with weak long deflexed flat spines, spadix unarmed scurfy fruit globose cuspidate *Miq Fl Ind Bat* iii 90, *Walp Ann* iii 4771 v 827 Calamus monticolus *Griff in Calc Journ Nat Hist* v 90, *Palms Brit Ind* 97, t 214 A, B, C

MALAY PENINSULA, on Coonong Menong a spur of Mt Ophir alt 1500-2000 ft, and PENANG HILL, half way up *Griffith*

Stem about 8 ft *Petiole* 10 i leaflets 10 11 by ½ in. *Outer spathe* very open 16–17 in long, beak 3 10 in flat spathe unarmed except towards the apex *Fruit* the size of a marble tawny scales channelled and with a dark brown intramarginal *line*; fruiting calyx explanate lobes broad petals twice as long, ovate *Seed* with a fleshy covering —Descript from Griffith The Penang plant has much coarser spines on the spathe and the fruit is more narrowed into a beak; Beccari doubts its being conspecific with the Malaccan I have seen only very imperfect specimens

12 **D. petiolaris,** *Mart Hist Nat Palm* iii 326 slender, scurfy, leaves long-petioled leaflets very long crowded equidistant very narrowly linear tips spinulose costæ 3 setulose above the median only beneath, margins setulose petiole armed below with seriate spines above with dorsal hooked spines sheaths crinitely clothed with long close set ascending slender seriate spines outer spathe shortly beaked densely armed with long slender spines, spadix short fusiform branches toment se male calyx cylindric 3 toothed *Miq Fl Ind Bat* iii 8 *Walp Ann* iii 475, v 827 Calamus petiolaris *Griff in Calc Journ Nat Hist* v 93, *Palms Brit Ind* 101, t 216 f vii, ? *Miq Palm Archip Ind* 28

MALACCA *Griffith*

Stem erect *Leaves* 4 5 ft exclusive of the 5 7 ft petiole leaflets 15–17 by ⅓–½ in *Spathe* 4 in narrowly fusiform scurfy beak ⅓ the length of the body, or longer *Fruit* unknown —Griffith says that probably two species are included here differing in the length of the leaves one with an unarmed rachis of the leaves long ... and ... spikes and a cylindric scutely shortly toothed calyx but his definition of the two is not very clear

13 **D. tabacinus,** *Becc mss* sheaths rachis and petiole of leaf and branches of spadix brown furfuraceous, leaves long petioled leaflets very many equidistant narrowly linear tips spinulose costæ 3 setulose above and on the median beneath margins setulose petiole subcylindric and sheath armed with small flat pale spines outer spathe narrowed into a beak as long as the body or longer crinitely clothed with long straight slender spines fruit subglobose pale beak conical

PERAK *Kunstler Collector* (2537)

Stem erect 2 3 ft *Leaflets* 12 14 by ½ ¾ in *Spathe* 6 in, its beak 3 in *Fruit* ¾ in diam, pale straw ... narrowed at both ends, scales channelled tips dark cold ..., fruiting calyx ... fusiform ... lobes broad petals twice as long —It is distinguished from *D petiolaris* by the long beak of the spathe

14 **D. calicarpus,** *Mart Hist Nat Palm* iii 327, t 175, f vi, leaflets equidistant very many linear ... pointed 3 costæ above setulose median or all beneath margins setulose petiole armed with long straight and short hooked spines sheaths scurfy armed with long slender subseriate flat erect spines outer spathe moderately beaked crinite all over with long slender pale bristles 2nd and 3rd bearded chiefly along the middle, male spadix much branched margins of pedicels bearded,

spikes scurfy fruit globose tawny *Miq Fl Ind Bat* iii 87, *Walp Ann* iii 475 v 827 Calamus calicarpus *Griff in Calc Journ Nat Hist* v 92, *Palms Brit Ind* 99, t 215 A, B, C, D, t 116, f v vi

MALACCA, *Griffith* PERAK, *Scortechini*

Stem erect or subscandent with the sheaths 1 in diam *Leaves* 6–8 ft, upper small, with long flagella leaflets 12–13 by ½–⅓ in petiole 1 ft, base not gibbous or puckered *Outer spathe* 12–16 in spines and hairs 1–1½ in long, beak 2–3 in, naked or bristly at the base only *Male spadix* 6 16 in much branched sp kes flexuous scurfy, calyx subcylindric 3 toothed petals not twice as long *Fem spadix* shorter 4–8 in, less but more stoutly branched, calyx ovoid teeth bearded *Fruit* cuspidately mammillate ¾ in d in tawny scales with a dark marginal band, deeply channelled, fruiting calyx explanate, lobes broad, petals rather longer *Seed* globose, albumen deeply ruminate embryo basilar —Descr chiefly from Griffith Beccari says of it very difficult to distinguish from *petiolaris* and *monticolus* in the absence of complete specimens of all

Sect II **Piptospathæ.** *Outer spathe* not completely enclosing the inner *Spadix* diffusely branched

* Spathes at first tubular then open, all deciduous or the outer alone more persistent armed with short stout spines Spadix narrow and elongate before flowering then paniculate

† *Mouth of sheath naked or armed with scattered spines pointing variously Fruit resiniferous except D leptopus*

15 **D. micracanthus,** *Becc mss* leaflets alternate or distantly subopposite linear lance late caudate acuminate costæ 3 minutely setulose on both surfaces, as are the margins petiole very gibbous and transversely puckered at the base slender 2 edged biconvex armed with long rather distant small curved prickles on the back and here and there on the sides and on the rachis sheath long slender glabrous armed with very short deciduous prickles at length muriculate Calamus micracanthus *Griff in Calc Journ Nat Hist* v 62 *Palms Brit Ind* 72, *Mart Hist Nat Palm* iii 339, *Miq Fl Ind Bat* iii 128, *Walp Ann* iii 489, v 831 (*micranthus*)

MALACCA *Griffith*

The only specimen seen is of a leaf with a cylindric pale sheath a foot long, covered with scattered or subseriate minute tubercles, a rather slender petiole 6 in long dilated at the base and gibbous with small very scattered spines the rachis more flagelliferous very slender and smooth, the leaflets 8–10 by ¼ in, with very long filiform bristly tips

16 **D. propinquus,** *Becc mss* leaflets numerous equidistant linear lanceolate, costæ 3 all sparsely setulose above the median alone beneath [illegible] ines [illegible] has [illegible] oints [illegible] adix erect fruiting nodding fruit globosely ovoid strongly beaked red brown, scales deeply channelled Calamus Draco, *Griff in Calc Journ Nat Hist* v 65, *Palms Brit Ind* 75 (*excl Syn Roxb*) t 201 A B *Mart Hist Nat Palm* iii 175 f 10, 3–8

PENANG, *Griffith, Lewes* PERAK *Scortechini* —DISTRIB Sumatra.

Stem stout, erect at length scandent *Leaflets* 1 [illegible] 18 by ½ ¾ in petiole ½ terete, 1 in diam *Fruit* ¾ in diam yielding dragon's blood copiously, sturdy

pedicelled, scales naturally whitish but incrusted with red gum *Seeds* rarely 2, subconical, dorsally alveolate and tubercled with a deep lateral cleft —The Perak fruits are accompanied by ensiform leaflets 2 ft long by 2 in broad with aculeolate margins Beccari doubts their belonging to the same species as the fruits —The seeds of Griffith's plant are globose and smooth *J D H*

17 **D. didymophyllus,** *Becc mss*, leaflets in distant opposite or alternate pairs broadly ensiform or elliptic, costæ and margins quite smooth, fruit as in *D propinquus*, but with less resin

PERAK *Scortechini*, alt 2500–3000 ft, *King's Collector* (2593, 5704, 6313). JOHORE, *Kurz* —DISTRIB Sumatra

Stem 20 30 ft, scandent *Leaves* 5–7 ft, leaflets 8–16 by 1–2½ in, acute, many-nerved, quite smooth on both surfaces, as are the margins, petiole 2–3 ft, and rachis semiterete, both armed with scattered small short stout nearly straight spines and tubercles, rachis armed with distinct solitary spines and 3 fid claws, sheaths scurfy, armed with very broad flat spines mouth oblique naked *Spathes* coriaceous, flat lower 6–10 in, transversely armed with many series of confluent short irregular spines; upper persistent, small r *Spadix* erect, peduncle armed with strong straight flat scattered spines, spikes densely fascicled, slender, erect, flexuous *Fruit* ¾ in diam, cuspidate, red brown and explanate calyx as in *D propinquus*

18 **D. leptopus,** *Mart Hist Nat Palm* iii 206 329 leaves long-petioled, leaflets many equidistant narrowly linear-lanceolate caudate-acuminate, costæ 3 all naked, or setulose beneath near the margins, rachis very stout armed with short stout simple and 2–3 fid claws, petiole armed with short solitary spines, sheath swollen at the petiole armed with fascicled or seriate flat spines, outer spathe with revolute margins towards the open tip, keels 2 armed with stout spines fruit ovoid or ellipsoid *Miq Fl Ind Bat* iii 99 *Walp Ann* iii 479 v 818 Calamus leptopus, *Griff in Calc Journ Nat Hist* v 73, *Palms Brit Ind* 87, t 205, A, B

MALACCA *Griffith* PERAK *King's Collector* (4774, 5919) *Scortechini*

Stem scandent 20 30 ft, sheaths about 1 in diam *Leaflets* 15–16 by ¾–1 in, tip capillary bristly rachis as thick as the thumb subbiconvex, petiole about 2 ft, trigonous; lower spines 1 in and upwards *Spathes* coria cons lower 8–10 in, lanceolate, open, tip flat bro l upper open ... larger than their inflorescences *Spadix* 3–4 ft, very slender, peduncle stoutly armed branches erect, unarmed ... teeth acut, corolla ... ithell iles, cinnamon ... t ch lizs grooved; ... *D propinquus*, the mature is more like *D Hystrix* —Descript chiefly from Griffith

†† *Mouth of leaf sheath armed with long flat erect spines, fruit not or sparingly resiniferous*

19 **D. Hystrix,** *Mart Hist Nat Palm* iii 205, 328, t 176, f 4, 3–4, leaflets very many equidistant narrow setaceously acuminate margins and costæ setulose on both surfaces rachis clawed, petiole armed with scattered long straight and short spines sheath swollen armed with very ... small elliptic ... spadix with ... *Miq Fl Ind* ... *Rumph* iii 21 (*excl descr. fruit*), t 135, f. A, B, C (excl D, E *oblongus*), *Miq* ...

Suppl 593 Calamus Hystrix, *Griff in Calc Journ Nat Hist* v 71, *Palms Brit Ind* 80, t 201, A, B C, *Miq Palm Archip Ind* 28

MALACCA *Griffith* at Ayer Punnus *Maingay* PERAK, *Scortechini*, *King's Collector* (551) — DISTRIB Java Sumatra

Stem scandent with the very stout sheaths 1½ in diam *Leaves* 7–10 ft rachis flagelliferous leaflets 10–15 by ⅓–½ in tips very slender setulose costæ sometimes 5, petiole 1–2 ft sheath woody stoutly obliquely crossed with half-whorls of close set flat spines, of which the lower series are ½–½ in long lanceolate very thin and appressed to the surface the upper or oral enormously long, strict *Lowest spathe* 4–5 in diam st woody stoutly armed, not beaked, upper narrower, more or less armed *Spadix* 2–3 ft peduncle rather slender armed, spikes 2–3 in, scurfy ascending flexuous, flowers paired celled, calyx cupular, teeth obtuse villous-tipped corolla twice as long ovoid *Fruit* about ¾ in long by ½ in diam, pale brown not shining shortly mammillate small obtuse channelled, margins of channels rather elevated *Seed* oblong pitted pits resinous albumen deeply ruminate, embryo basilar — The enormous spines of the leaf sheaths are a remarkable character

Var *minor* Becc mss, stem 2–8 ft with the sheaths ½–¾ in diam, leaves 1–4 ft, leaflets 5–10 in, fruit much smaller —Perak 300–1500 ft, *King's Collector* (5697, 5142, 5466)

20 **D. Kunstleri,** *Becc mss*, leaflets many equidistant linear setulose on the 3 costæ above and median beneath, margins setulose, petiole robust scurfy margins armed with long stout spreading spines, sheath with many oblique series of long stout flat spines alternating with shorter setiform ones mouth with a few very long ones, lower spathe coriaceous softly scurfy keel spinous peduncle of spadix long slender armed with whorls of spines, fruit globose top conical not beaked

PERAK, *Scortechini* (652 *King's Collector* (10 204)

Stem erect 2–3 ft sheaths 3 in diam *Leaflets* 14–18 by ⅝–¾ in, rachis armed with 3 fid claws *Peduncle* of spadix 8–10 in *Fruit* ¾ in diam, tawny, top suddenly contracted into a low cone scales few, channelled, broad, margins not scarious and hardly discoloured fruiting calyx small, explanate *Seed* subglobose —I have seen only a portion of a leaf and of a fruiting spadix

21 **D. vagans,** *Becc mss*

PERAK, alt 4000–5000 ft *King's Collector* (4129)

Stem scandent, sheaths ⅝ in diam *Leaflets* 14 by ⅜ in, very narrow straight and finely acuminate *Fruit* as in *Kunstleri* but smaller —I have seen only a portion of a leaf and fruit without calyx

** Outer spathes at first tubular, then open, all deciduous or the outer more persistent, hardly spinous, but densely clothed with rigid needle like spiculæ Sheath of leaf with a spinulose membranous collar or ring Spadix elongate before flowering, then paniculate

22 **D. Sabut,** *Becc mss*, leaflets in fascicles of 9–10 in, the lower

PERAK, *Scortechini* (653b)

Internodes 6–8 in, with a reversed membranous collar *Flagellum* of rachis very short —I have seen no specimen J D H

D. [illegible] les ... oth ... m- ... ely

PERAK, *Scortechini*
Founded on two flowerless specimens, neither of which have I seen —*J D H*

24 **D. macrophyllus,** *Becc* , leaflets 4 in 2 very distant pairs oblong-lanceolate 20 by 4–5 in with 7–8 acute naked costæ, petiole 2 ft biconvex, armed with 2–3 fid spines, sheaths $\frac{3}{4}$–$\frac{7}{8}$ in diam with 3–4 membranous collars

PERAK, *Scortechini*
Founded on a single flowerless specimen, which I have not seen —*J D H.*

25 **D. verticillaris,** *Mart Hist Nat Palm* iii 329, t 175, iii t 72, f vi, vii, leaflets many equidistant ensiform setaceously acuminate, margins and costæ very sparingly setulose sheath armed with whorls of very long flat weak spines alternating with whorls of confluent black bristles, lower spathe thinly coriaceous densely crinite with series of fascicled black bristles, male spadix slender spikes sub-erect slender, flowers minute densely crowded in two collateral series fruit small sessile globose *Miq Fl Ind Bat* iii 99, *Walp Ann* iii 178, v 828 Calamus verticillaris *Griff in Calc Journ Nat Hist* v 63, *Palms Brit Ind* 73, t 200 A, B, C, D

MALACCA, *Griffith* PERAK, *Scortechini*, at Larut and Goping, *King's Collector* (576 6388)
Stem 20–40 ft scandent, sheaths about 1½ in diam *Leaves* 5–15 ft , leaflets [illegible]

tracted, fam with spreading branches, peduncle unarmed *Male spikes* ½–1 in ; spathellule cupular, acute *Flowers* distichous, horizontal most densely packed, calyx cupular, obscurely toothed; petals twice as long *Fem spikes* 3 4 in. *Fruit* ½ in diam., top conical, scales whitish faintly channelled, margins brown *Seed* globose, albumen deeply ruminate.

*** Outer spathe acutely 2 keeled, keel alone setose Leaf sheaths armed with flat spines confluent in an annular spinulose crest.

26 **D. geniculatus,** [illegible]

bristles below which is a thick ring of confluent bristles outer spathe lanceolate, spadix much branched, male fl densely crowded in collateral series, fruit subglobose shortly stoutly beaked *Miq Fl Ind Bat* iii 91, *Walp Ann* iii 478 v 828 Calamus geniculatus *Griff in Calc Journ Nat Hist* v 67, *Palms Brit Ind* 77, t 202, A, B, *Miq Palm Archip Ind* 28

PENANG, *Lewes* PERAK, alt 2 3500 ft, *King's Collector* (2931, 2735, 6306, 7849) SINGAPORE *Lobb*

Stem stout 20–2 ft scandent, nodes swollen *Leaves* 10–14 ft., leaflets 16–20 by ⅔–1 in, margins quite smooth, long tips setose, petiole stout, spines on lower part on often terete with the central 6 7 in long and slender but stiff *Spathes* all deciduous upper thinly coriaceous unarmed *Spadix* (geniculate Griff) 3 ft, peduncle 6–12 in flattened with marginal spines not 2 edged, spikes ½–¾ in, spreading with the flowers ⅛ in broad *Male flowers* most densely imbricate, horizontal in two series, ⅓ in long and narrow, spathellules quite entire, calyx shortly cylindric, striate corolla terete, four times as long, smooth not striate, very narrow *Fruit* ¾ in long shortly pedicelled, sometimes almost ellipsoid pale dull yellowish brown, scales with a shallow channel and brown margin —There may be more than one species included here, the fruiting spadices of Nos 576 and 7849 look very different No 576 from Gopang Perak has the slender fruiting spadix, with distant fruits, as in Griffith's figure No 2735

internodes and stout spikes 4–6 in long, it most resembles the Penang form

**** Outer spathe lanceolate slenderly 2 keeled, wholly deciduous after flowering Leaf sheaths armed with isolated or confluent spines, not annular crests Spadix elongate

27 **D. longipes**, *Mart Hist Nat Palm* iii 329, t 176, f v 2, 3, leaflets equidistant linear lanceolate or ensiform subulate acuminate

beak
D.
86,
imus
78, t.

MALACCA, *Fernandez*, *Maingay*, *Hervey* —DISTRIB Sumatra, Banca

Leaves with the flagellum about 12 ft, petiole 2 ft, young floccosely scurfy; leaflets 12–14 by 1¼ in *Spathes* long and narrow, thinly coriaceous, nearly or quite unarmed young scurfy *Male spadix* nodding, peduncle 2 ft, 2-edged, unarmed or with a
slender and zig za
erecto patent, caly
long not striate
stout, scurfy, spikes 3–5 in *Fruit* ¼ in apart, ¾ in long, calyx very shortly pedicelled, broadly campanulate, 3-lobed to the middle lobes appressed to the base of the fruit, scales pale yellow brown, shining, concolorous, faintly channelled *Seeds* oblong, albumen strongly ruminate, embryo basal —Griffith describes *Calamus longipes* as having equidistant leaflets, his specimens are too imperfect to show this character In Maingay's specimen they are inequidistant as described by Blume in his *D strictus* As in other species the costæ of the leaflets probably vary much as to being more or less setulose on one or both surfaces.

IMPERFECTLY KNOWN SPECIES

Besides enumerating the above more or less imperfectly described species,

Beccari has indicated the existence of about 7 other new Malayan Peninsula ones, but these are in far too imperfect a condition to render it advisable to register here the names he has given them.

25 ZALACCA, *Reinw*

Stemless soboliferous, armed palms. *Leaves* pinnatisect, not flagelliferous, leaflets narrowly linear-lanceolate *Spadix* interfoliar, pendulous, flowering branches catkin like *Spathes* persistent, lower sheathing, incomplete bracteoles cupular 2-celled, flowers coriaceous, densely crowded, polygamous *Male fl* calyx tubular, 3-fid corolla tubular, segments valvate stamens 6 anthers short *Fem fl* larger perianth accrescent, calyx trifid corolla lobes lanceolate, valvate, staminodes 3 or 6, ovary 3 celled, stigmas 3, subulate, ovules basilar *Fruit* globose or obovoid, 1–3 seeded clothed with reversed or spreading scales *Seeds* 1–3, erect, top excavated, testa crustaceous, outer coat fleshy, albumen equable, embryo subbasilar —Species 9 or 10, chiefly Malayan

The species are for the most part imperfectly known The Malayan *Z edulis*, Reinw no hitherto found in the Malayan Peninsula has the leaflets white beneath.

1 **Z. secunda,** *Griff in Calc Journ Nat Hist* v 12 *Palms Brit* [illegible] concolorous acutely 3-costate margins [illegible] on the under face male spadix [illegible] spathes peduncled fem spadix [illegible] fruit clothed with spreading [illegible] Calamus collinus, *Griff Palms*

UPPER ASSAM *Mann*, in the Mishmi Mts, *Griffith*

A very imperfectly known species, of which Griffith describes only the male spike Mann's specimen consists of a leaflet, and young fruit, he describes the leaf as 30 ft long, the leaflets as 33 in. long by nearly 3 broad coriaceous, with three stout costæ acute on both surfaces and spinulose beneath.—Fruits received quite recently at Kew from Mr Mann are unfortunately in too broken a condition to determine their form, they appear to have been ovoid 2 in.? long, ending in a short cone as in *Eu eissonia*, the pericarp thin, clothed with spreading and ascending subulate-lanceolate recurved dark brown scales ½ in long and under, there is no appearance of a succulent endocarp. *Seeds* (1–3?) 1–1½ in. long, very various in shape, from subglobose to hemispheric or trigonous with a convex back and very rounded angles dark brown not polished with a deep small apical hollow leading to the canal which extends more than half way into the dense albumen, embryo above the base dorsal or sublateral, indicated externally by a circular convexity with depressed margins ½ in. diam or less.

2 **Z. affinis,** *Griff in Calc Journ Nat Hist* v 9, *Palms Brit Ind* 12, t. 170 A, B C, leaflets concolorous strongly falcate costæ 3 and [illegible]

MALACCA, *Griffith* PERAK, at Larut, *King's Collector* (3115) —DISTRIB Sumatra.

Leaves 12 13 ft., petiole half the length, slender armed with long slender spines, leaflets fascicled 18–20 by 2½ in., costæ slender, acute beneath. *Male spadix* about 1½ ft., spathes imbricate lacerate *Spikes* ¾–1 in, bracts membranous, 2 fid.,

bracteoles penicillate Fruit 2¼ by 1¼ in cuspidately mammillate; scales closely imbricate chestnut brown Seeds 1-3 plano-convex —Descr chiefly from Griffith

3 **Z. conferta,** *Griff in Calc Journ Nat Hist* v 16, *Palms Brit Ind* 1 t 1 A B C, leaflets linear-ensiform concolorous straight or slightly falcate fem spadix large copiously branched from the base very compact spikes densely crowded much longer than their spathes, fruit turbinate not spinous *Mart Hist Nat Palm* iii 201, t 173, 174, *Becc. Males* iii 67

MALACCA *Griffith*.—DISTRIB Borneo

Stemless at least ... others forming an impenetrable jungle *Leaves* 15-20 ft ... petiole half the length of the blade stout flattened above, spines short, ... leaflets equidistant alternate 2 ft by 2½ in, subulate acuminate, tip and margins setose ... bristly on the upper surface *Spadix* 8-12 in, crowded ... male flowers in pairs, bracteoles villous *Fruit* crowded in a formless mass scales quite smooth, aspect waxy and shining margin denticulate tawny greenish ... carp white spongy *Seed* broadly turbinate —Distinguished by habit ... of the leaflets their bristly costæ and ... short white spines and crowded thyrsiform fruiting spadixes —Descr from Griff h

4 **Z. Wallichiana,** *Mart Hist Nat Palm* iii 200, 325, t 118 119, 136 leaflets inequidistant ... oblong lanceolate with very long filiform setulose tips ... naked male and fem spadices very long fastigiately branched spikes ... distant much shorter than their spathes, fruit obovoid shortly imbricate scales with long reflexed points *Kurz in Natuurk Tydschr Ned Ind* xxvii (1864) 216 *For Fl* ii 511, *Becc Males* iii 66 *Z edulis Wall Cat* n 5000 *Pl As Rar* iii 14 t 222-224, *Z Rumphii*, *Griff in Calc Journ Nat Hist* v 8, *Palms Brit Ind* 10, t 175 *Blume Rumphia* ii 1... Z macrostachya, *Griff ll cc* 13, and 15, t 178 A, B, C, *Becc l c* 66

BURMA *Kurz* MALACCA, at Ching, *Griffith* PENANG and SINGAPORE —DISTRIB Siam Banca

Stem very short or 0 *Leaves* 15–20 ft , leaflets approximate in groups of 2–4, and alternate 2 3 ft by 1½–2 in , spinulosely ciliate above the middle, upper confluent , petiole 8 10 ft and rachis copiously armed with broken spirals of strong subreflexed spines *Spadices* several feet long, rachis woolly *Spikes* cylindric, villous, 1½–2 in long , flowers small, rose-cold *Spathes* variously ruptured, floral terminated by dense tufts of rose-cold paleaceous hairs *Fruit* in dense heads, 1 in long or more 1–3 celled , scales brown, tips terminating in a reflexed brittle bristle —Descr from Kurz For Fl l c —"Spadices dimorphic, one male only, *with densely tomentose spikes*, the other monœcious very dense-fld and difficult to

... Wallichiana

5 **Z. glabrescens,** *Griff in Calc Journ Nat Hist* v 14, *Palms Brit Ind* 17, t 179, leaflets close set slightly falcate concolorous, tips subulate filiferous, male spadix much branched, spikes much longer than their spathes, fem spadix reduced to few branches each bearing a very large solitary long peduncled nodding glabrous spike clothed with broad glabrous imbricating bracts

straight spines, rachis and flagellum with reversed claws *Spikes* 3 4 in, tawny-tomentose, very compact, bracts smooth a little longer than the villous bracteoles *Fruit* ½ in long, obovoid, mucronate, scales with a broadly lacerate pale brown membranous border —Descr from Kurz (of his *scaphigera*) in *For Fl l c* referred here by Beccari

6 **K. ferox,** *Becc Males* ii 73, leaflets shortly petiolulate trapezoid about as long as broad pale beneath obtusely erosely toothed, sheath and ochrea thickly armed especially on the petiolar side with short spines, above fibrous reticulate glabrous or finely scurfy

Var *malayana*, Becc mss, spines of the sheath and ochrea shorter, and covering the ventral face of the latter

Var *malayana*, PERAK, at Larut (Hort Calc 6063); at Gunong Tjick, Sept, 1844, *Scortechini*

I have seen no specimen The type is Bornean

7 **K. polystachya,** *Mart Hist Nat Palm* iii 210 t 172, f 1, leaflets cuneiform or obliquely trapezoid glaucous beneath obtusely toothed sheath and ochrea unarmed spikes long slender flexuous *Miq Fl Ind Bat* iii 77, *Becc Males* ii 74 Calamo agus polystachyus *Griff ex Mart l c* 211 C ochriger, *Griff Palms Brit Ind* p x t 216, f 1.

MALACCA, *Griffith*

rusty-pubescent
forming a pani
a span to a f
bracts empty,
C ochriger
Blume

8 **K. tenuissima,** *Becc Males* ii 275, very slender, leaflets 3–6 obovate or oblanceolate acuminate subacutely toothed pale beneath sheath sparingly armed, ochrea unarmed, spikes few, spathes tubular inflated dilated above

MALAY PENINSULA; Perak, at Larut *King's Collector* (1057)

Leaves with a very slender petiole, leaflets 1 4 in long by 1–1½ broad, petiole very short base callous swollen *Spikes* apparently glabrous from the bracts exceeding the calyx

9 **K. flagellaris,** *Miq in Journ Bot Neerl* 15, *Fl Ind Bat*

cuneate rusty pubes-
dorsally unarmed on
spikes tomentose K
sp from Borneo and

MALAY PENINSULA, Perak *Scortechini*, at Assam Kumbung, *Wray* (n 3127)

Resembles in the form of its leaflets and their colouring beneath *Z rubiginosa*, which has longer straighter less cuneate leaflets with short not subulate teeth

27 CERATOLOBUS, *Blume*

Palms with the habit and foliage of *Korthalsia* but with flagelliferous leaves *Spadix* very slender loosely panicled, branches filiform, peduncle very long pendulous prickly usually adnate to the sheath of the leaf opposite, spathe small solitary, membranous, narrow, flattened, beaked, at length split down the ventral face, flowers polygamous, in pairs, the upper ebracteate the lower bracteate and bracteolate *Male fl* Calyx small 3-fid lobes triangular valvate, stamens 6, on the bases of the petals anthers linear, pistillode minute *Fem fl.* Calyx of the male; corolla 3-fid valvate, ovary ovoid ovules 3 basilar, erect *Fruit* small, 1-celled, 1-seeded, pericarp as in *Korthalsia* *Seed* globose, erect, testa fleshy, albumen ruminate, embryo basilar —Species Malayan

1 **C. lævigatus**, *Becc mss*, leaflets in inequidistant groups of 2-3 pairs narrowly
a long straight
peduncled fruit
Nat Palm in
Journ Nat Hi

PERAK, *King's Collector* (575, 971, 5916); on Waterfall hill, *Wray* (2919)
Stem 15 20 ft about ⅓ in diam
green, 5-9 by ½-⅔ in thin, rachis sle
spines, petiole very short, base tumid,
simple flattened spines *Spadix* 4-8
branches slender, sparsely pubescent
smooth *Male fl* sessile, subglobose,
petals and bracteoles deeply grooved
to a broad conical beak scales obsc

2 **C. Kingianus**, *Becc mss*, leaflets few large cuneately rhomboid or trapezoid lobed and toothed in the upper half deeply plicate pale beneath, spadix sessile, fruit spherical shortly broadly beaked

PERAK, *Hullett* (*Herb Calc* 2517, 2856 5589), *Wray* (2869)
Stem 20-25 ft, about 1½ in diam *Leaves* 3-4 ft, leaflets 6-9 by 3-4 in, lower half triangular-cuneate, rachis stout armed with short solitary and 2-5 fid claws, petiole 6-8 in, more or less muricate and armed with scattered short simple and compound spines, sheath transversely muricately ridged, unarmed, young white furfuraceous *Spadix* 8-10 in, erect, narrow, branchlets short, glabrous *Spathe* 8-12 in, elongate-oblong, flat, thinly coriaceous, quite smooth *Male fl* sessile, about $\frac{1}{12}$ in long, narrowly oblong, calyx minute, cupular, petals narrow thrice as long, both deeply grooved *Fruit* ½ ⅓ in diam, brown, scales hardly channelled. *Seed* nearly smooth *Fruiting calyx* minute, petals broadly ovate.

28 PLECTOCOMIA, *Mart.*

very long *Leaves* flagelli-
simply branched, branches
imbricating distichous inflated
the spicate diœcious flowers.

Stem slender, attaining 80 ft *Sheaths* striate, sparsely prickly, uppermost unarmed *Leaves* 6–10 ft [illegible] lets 5–10 by ¼ in, finely acuminate, keel sparsely bristly above, smooth beneath *Spadices* many, from the uppermost leaf sheaths, which bear a simple armed flagellum and no leaflets lower 4–5 in, with 4–5 pendulous spikes each 6–8 in long *Spathes* short, tubular, like the secondary spathes of *Calamus* *Spikes* flexuous rusty-pubescent, flowers 2 bracteolate outer bracteole minute, inner auricular *Fruit* immature, pericarp spongy, scales brown, with whitish fimbriate margins

2 **P. Wrayii,** *Becc mss*, leaves petioled fruit globosely ovoid shortly narrowed at the top with about 23 rows of scales

MALAY PENINSULA, Perak, *Wray* (2121 ♀), *Herb Hort Calcutt* (5282 ♀, 3117 ♂)

Very near *P geminiflorus*, distinguished by the longer petiole and fruit

3 **P. paradoxus,** *Becc mss*, leaves shortly petioled, leaflets lanceolate scattered in distant pairs shortly acuminate spadices bifariously decompound, spathels tubular male spikelets exserted recurved Calamus paradoxus, *Kurz in Journ As Soc* xliii (1874) ii 213, t 29, 30, *For Flor* ii 521

MARTABAN, *Kurz*

Stem with the sheaths 1 2 in diam *Leaves* 5–7 ft, leaflets 1–1½ ft by 1 in, in alternate pairs, thin obscurely remotely appressedly ciliolate, petiole armed, sheath with pectinate spines, flagellum very long *Spathes* tubular, smooth, obliquely truncate and acuminate, spathels similar but much smaller, distichously imbricated; bracts spreading, glabrous *Fem fl* and *fruit* unknown

30 MYRIALEPIS, *Becc mss*

Characters as far as known of *Plectocomiopsis* but the minute scales of the fruit are disposed without order —Species 2, a Bornean and the following

M. Scortechini, *Becc mss*

MALAY PENINSULA, Perak *Scortechini* (n 457b)

[illegible] spathels, calyx 3 lobed, corolla rather [illegible] ips not recurved, mesocarp between [illegible] n horny equable —Differs from the [illegible] *triqueter* Becc, Malesia, iii 62) in the obtusely angled trigonous sparsely spinous leaf sheaths The specimens are very imperfect

31 EUGEISSONIA, *Griff*

[illegible] *Leaves* pinnatisect, leaflets lanceo- [illegible] *dix* terminal, erect, thyrsiform, [illegible] leaf sheaths, branches erect, [illegible] passing into bracts and brac- [illegible] or 2–3 nate, 1–2 sexual *Male* [illegible] pungent, valvate, [illegible] larger, perianth [illegible] se and transverse [illegible] ned *Fruit* ovoid, [illegible] ed, scales minute, [illegible] equable; embryo basilar —Species about 6, Malayan

E. tristis, *Griff in Calc Journ Nat Hist* v 101, *Palms Brit Ind* 109, t. 220 A, *Mart Hist Nat Palm* iii. 212, t 179 180, *Becc in Nuov. Giorn Bot Ital* iii. 28

MALAY PENINSULA and PENANG *Griffith*, &c

Stems densely tufted, very short or 0 *Leaves* 15–20 ft, leaflets many, 2–2½ ft., narrow-lanceolate, subulate acuminate midrib bristly above, petiole 7–10 ft., armed with flat brown spines *Spadix* 4–6 ft, sheaths and spathes armed, flowers 1–1½ in long, terminal on the flexuous branches of the spadix, bracts many, closely imbricating *Fruit* the size of a hen's egg beak clothed to the tip with scales

32 METROXYLON, *Rottb*

Stout monocarpic palms *Leaves* equally pinnatisect, leaflets opposite [illegible] *Spadix* very large panicled, clothed with coriaceous spinous spathes, spikes sessile catkin like, short, distichous recurved, bracts broader than long, bracteoles cupular [illegible] coriaceous *Male fl* calyx [illegible] oblong, valvate, stamens [illegible] *fl* like the males, perianth [illegible] cup, ovary oblong, retrorsely scaly imperfectly 3 celled, [illegible] 3 toothed, ovules 3, basilar *Fruit* ellipsoid or subglobose, [illegible] 1 seeded, pericarp tessellate with reversed scales, endocarp spongy [illegible] erect, subglobose, rough, albumen ruminate, embryo ventral [illegible] Malayan and Pacific

1 **M. Sagus,** *Rottb in Nye Saml K Dansk Vid Skrift* [illegible] spathes unarmed *Miq Fl Ind Bat* iii 147, *Becc in Nuov Giorn Bot Ital* iii 29 M inermis, *Mart Hist Nat Palm.* iii 215 [illegible] lævis, *Rumph Herb Amb* i 76 *Blume Rumphia*, ii 147, t [illegible] *Calc Journ Nat Hist* v 20, *Palms Brit Ind* 24 (*not* t [illegible]) Rumphii *Blume l c* t 126 227 ? S Kœnigii, *Griff ll. cc.* [illegible] t 181 S inermis *Roxb Fl Ind* iii 623

MALACCA (wild or cult ?) *Jack* &c —DISTRIB Malay Islds

Trunk about 20 ft with many basal offshoots, as stout as that of the [illegible] annulate clothed above with old leaf sheaths *Leaves* as in the [illegible] more erect, unarmed, leaflets linear, acute, keeled, smooth *Infl* appearing [illegible] plant is about twenty [illegible] spikes 5–8 in *Flowers* [illegible] mustard seed, bisexual [illegible] apple, scales shining [illegible] to Griffith the Indian *Metroxylon* bears no resemblance to a Cocoa-nut [illegible] Sago Palm

2 **M. Rumphii,** *Mart Hist Nat Palm* iii 213, [illegible] *Fl Ind Bat* iii 149, [illegible] Sagus Rumphii, *Willd* [illegible] na, *Blume Rumphia* [illegible] *nph Herb Amb* i 75 [illegible]

MALACCA (wild or cult) —DISTRIB Malay Islds

There appears to be great confusion in the synonymy of the [illegible] of this genus, and that here given may be open to correction. [illegible] *M Rumphii* is much less cultivated than *M Sagus*

33 BORASSUS, *Linn*

A very tall diœcious palm, trunk stout, unarmed [illegible]

fan shaped, plicately multifid, petiole spinous, ligule short *Spadices* very large, simply branched, peduncle sheathed with open spathes, males with stout cylindric branches that are densely clothed with closely imbricating bracts, enclosing spikelets of flowers which hence appear as if sunk in cavities of the branch, fem spadix sparingly branched, bearing few scattered solitary flowers *Male fl* small, mixed with scaly bracts, secund in two series in a small spikelet, and protruding one by one from the

trigonous entire or 3–4 partite, 3–4 celled, stigmas 3, sessile recurved; ovules basilar, erect *Fruit* a large subglobose drupe with 1–3 obcordate fibrous pyrenes, pericarp thinly fleshy, stigmas terminal *Seeds* oblong, top 3-lobed, testa adherent to the pyrene, albumen equable hollow, embryo subapical

B. flabellif
xiii 827, *Roxb*
167, *Mart Hist*
222, *Thw Enur*
Rumph ii 88,
Cat Bomb Pl
Rumph Herb
Fruct i 21, t. 8

Cultivated throughout the plains of INDIA, BURMA and CEYLON —DISTRIB Malaya, Afr trop

Trunk 60– ... *Leaves* 6–10 ft d.an ... 't, linear, 2 fid, margins ... ry stout *Male fl* small,

34 COCOS, *Linn*

Unarmed, monoecious palms *Leaves* pinnatisect; leaflets narrow. *Spadix* erect, at length drooping, simply panicled, branches bearing scattered fem fl, often between 2 males towards their bases and males above. *Spathes* 2 or more, lower short, upper fusiform or clavate, bracts various, perianth coriaceous *Male fl* unsymmetric, sepals small, valvate, petals oblong acute, valvate, stamens 6, filaments subulate, anthers linear, erect, pistillode minute or 0 *Fem fl* usually much larger, ovoid, perianth greatly accrescent; sepals imbricate, petals shorter, convolute ... ruled, ... ovoid, ... endo- ... *Seed* ... lining the endocarp with a thick hard coat, embryo opposite one pore —Species about 30, all American, one of them cosmopolitan in the tropics

C. nucifera, *Linn. Sp Pl* 1188, *Mart Hist Nat Palm* iii. 123 t. 62 75, 88, *Kunth Enum* iii 285; *Roxb Cor Pl.* i 52, t 73, *Fl Ind* iii

614, *Thw Enum* 330 *Brand For Fl* 556 *Kurz For Fl* ii 540, *Blume Rumph* iii 82 *Miq Fl Ind Bat* iii 64 *Hook Journ Bot* ii (1850), t 1 C nana, *Griff Notul* ii 160 —*Rheede Hort Mal* i t 1–4

Cultivated in the hot damp regions of India Burma, and Ceylon, especially near the sea (indigenous in the Cocos Isld and N Andaman, *Kurz*) —DISTRIB All tropical shores.

Trunk 40–80 ft flexuous annulate base thickened *Leaves* 12–18 ft, leaflets 2–3 ft, coriaceous, flaccid petiole 3–5 ft stout *Spadix* 4–6 ft branches flexuous, lower spathe 2 3 ft, oblong hard, splitting lengthwise, male fl small, fem 1 in long 2-bracteolate disk annular *Drupe* 4–10 in long trigonously obovoid or sub globose green or yellowish, albumen lining the endocarp *C nana* is a small low var grown in the Maldive Islds and Ceylon

ADDENDUM TO PALMS

TEYSMANNIA ALTIFRONS *Reichb f & Zoll in Linnæa* xxviii 657 *Miq Fl Ind Bat* iii 749 —Mr Ridley (Singapore) informs that this noble Sumatran Palm is also a native of the Malay Peninsula The genus is of doubtful affinity, but most probably belongs to the Tribe *Corypheæ* It may be recognized by its almost stemless habit, and enormous erect elongate-rhombic plaited leaves

ORDER CLXIV PANDANEÆ.

Small diœcious trees or shrubs often scandent with aerial roots *Leaves* usually trifarious, narrow acuminate, coriaceous, margins and keel usually spinously toothed *Spadices* axillary or terminal simple or branched, clothed with leafy spathes flowers small, crowded on a catkin like spadix or its branches bracts and bracteoles 0 *Perianth* 0 *Male fl* stamens

* Stem erect or prostrate Staminodes in fem fl 0 Carpels 1 ovuled 1 PANDANUS
Stem usually climbing Staminodes of fem fl. hypogynous Carpels many ovuled 2 FREYCINETIA.

1 PANDANUS, *Linn f*

Characters as above —Species numerous, all tropical, chiefly Mascarene and Malayan

* Carpels not united in groups

† *Male fl of free stamens with very short filaments Drupes with a pyramidal crown produced into a straight or curved spinescent style*

1 **P. fœtidus**, *Roxb Fl Ind* iii 742, shrubby, leaves 4–6 ft by 3–4 in, strongly spinous toothed, anthers very long slender, sub-solitary oblong or subglobose, crown of drupes smooth or nearly so. *th*

Enum iii 98, *Kurz in Seem Journ Bot* v (1867) 101, t 62, f 4, 5, 6, & *For Fl* ii 506, *Solms in Linnæa*, xlii (1878) 8 Frisquetia macrocarpa, *Gaud Voy Bonite Bot* t iv f 2–8 — Pandan *Wall Cat* 8591

ASSAM and the KHASIA HILLS, and Eastwards to BURMA The CONCAN?

A densely branched shrub *Leaves* with large strongly incurved usually distant marginal spinules *Spathes* pale yellow *Anther* ¼–½ in long *Fruit* very variable in size, from a hen's egg to a man's fist, red when ripe

2 **P. caricosus,** *Spreng Syst* iii 897, shrubby, leaves 5–8 ft by 2–2½ in spinulose-toothed, spinules minute white, anthers very long slender, fruits spicate subglobose obovoid or broadly oblong, crown of

MALACCA, *Griffith* — DISTRIB Malay Islds

Apparently closely allied to *fœtidus*, and like it with fœtid yellow spathes, differing in the spicate dark coloured or even blackish fruits and muricate crowns of the drupes I have seen no specimens I do not cite Rumph Herb Amb iv. 154 though it is the authority for the species the description and plate not being sufficiently explicit Nor are others of the authorities cited quite dependable

** *Male fl of many anthers umbellate on the connate filaments Drupes with a low crown and subulate or flattened simple or forked stigma*

3 **P. furcatus,** *Roxb Fl Ind* iii 744, arboreous, leaves 15–20 ft,

P caricosus, *Miq Analect Ind* ii 10 P spinifructus *Dennst Schluess Hort Malab* 23 Rykia furcata, *De Vriese in Verhandl Kl Acad Wet* (1851), *in Tuinb Fl* i 161, & *in Hook Kew Journ* vi (1854) 268 Barrotia diodon, *Gaud Voy Bonite Bot* t xiii f 15–24 — Pandan *Wall Cat* 8951

SIKKIM HIMALAYA alt 2–5000 ft *J D H* ASSAM, KHASIA and NAGA HILLS, and SILHET, alt 0–4000 ft, CHITTAGONG and BURMA — DISTRIB Malay Islds

Stem 30–40 ft., with aerial roots towards the base, as thick as the arm or leg,

4 **P. ceylanicus,** *Solms in Linnæa*, xlii (1878) 16, stems tall tufted very slender, leaves elongate margins with strong recurved spines anthers very short crowded on a very short fleshy tube, fruit broadly oblong, crown conical narrowed into a nearly straight spinescent style notched at the tip P furcatus, *Thw Enum* 327

CEYLON, *Thwaites*

According to a photograph of this plant as growing in the Ceylon Botanical Gardens, it has the habit of *P furcatus* but with a much more slender stem, more erect branches, and narrower leaves In the dried specimens, the spathes are much smaller, with long slender tips the anthers much shorter and the combined filaments very short. The fruit resembles *P fœtidus*, but the anthers are very different, about $\frac{1}{16}$ in long

5 **P. minor,** *Ham in Wall Cat* 8592, dwarf, stem prostrate slender, leaves ensiform flat margins spinulose tips abruptly caudate, spathes navicular apiculate, filaments in palmate clusters, anthers minute, fruit solitary broadly oblong, drupes smooth, crown hemispheric with a small concave central claw like style *Solms in Linnæa*, xlii (1878) 18 P unguifer, *Hook f Bot Mag* t 6317

In hot valleys of the SIKKIM HIMALAYA, ASSAM, SILHET, CHITTAGONG and PEGU

Stem 2 3 ft, as thick as the thumb *Leaves* subdistichous, 18–24 by 1–2 in, flaccid, marginal spines distinct *Fruit* shortly peduncled, as large as the fist, yellow *Drupes* obovoidly clavate, very smooth, style red —In young fruit, the style is flattened and often forked much as in *P furcatus* *Male fl* unknown

** Carpels connate in groups Stigmas sessile, peltate or reniform Filaments connate, anthers apiculate or aristate

6 **P. fascicularis,** *Lam Encycl* 372, t 1, shrubby, rarely erect, densely branched with copious aerial roots, leaves 3–5 ensiform caudate-acuminate margin with ascending spinules anthers interruptedly spicate, fruit large drupes obconic *Kunth Enum* iii 98, *Solms in Linnæa*, xlii (1878) 38 P odoratissimus, *Roxb Cor Pl* i 65, t 94–96, *Fl Ind* iii 738, *Kunth l c* 94, *ex l some syn* *Griff Notul* iii 159 *Ic Pl Asiat* t 174, *Kurz For Fl* ii 508, *Presl Ep*[illegible]
Bot v (1867) 127 [*n n Beau*]
Kurz in Seem Journ Bot v (18[illegible]
Gaud Voy Bonite Bot t 22 f 1
ii *Beibl* 14—Pandanus *Wa*[illegible]
Walp Ann i 753 —*Rheede Hor*[illegible]

Throughout the hotter moister parts of INDIA and much planted for fences —[illegible]

[illegible] carpels are all free, it is

[illegible] *Soc Beng* xxxviii ii [illegible] unk 60–70 ft as thick [illegible] arginal spines slender, [illegible] pressed crown and an[illegible]ry *Solms in Linnæa*, [illegible] v (1867) 105

ANDAMAN ISLDS, *Kurz*

Habit of a gigantic *P furcatus*, fruit as large as the human head or smaller,

orange yellow *Drupes* 2½–3 in long usually in groups of 3–5 in one series but often more, epicarp fleshy —Descr from Kurz

IMPERFECTLY KNOWN AND UNDESCRIBED SPECIES

1 P ALBUS, *Hort ex Steud Nom Ed* 2 ii 251 —"Ind Or"

2 P GRAMINIFOLIUS *Kurz in Seem Journ Bot* v (1867) 104 *For Flor* ii 507, leaves 12–18 by ¼–⅓ in, margins with minute straight spinules, young fruit erect ellipsoid, stigma sessile trigonous *Solms in Linnæa*, xlii (1878) 50—Tenasserim, *Helfer*

3 P HUMILIS, *Thwaites Enum* 327 (excl syn), leaves 7 ft by 1 1¼ in, very coriaceous with stout marginal spines filaments very short, anthers very slender ⅛ ¼ in long fruit globose spicate and drupes like those of *P furcatus*—Ceylon, *Thwaites*, *CP 3740 (used for fencing)*

4 P HOULLETII, *Carriere in Rev Hortic* 1868 210, f 23, leaves 6 ft 6 in by 3 3½ in abruptly caudate acuminate reddish green above coppery red beneath, marginal spines distant incurved male spadix 16 in long spikes 2½–4½ in, spathes coppery rose colrd, stamens in compact bundles —Singapore

5 P INTEGRIFOLIUS, *Lour ex Steud Nom Ed* 2, ii 251 —"Ind Or China" —I do not find this name in Loureiros Fl Coch uch or elsewhere

Lug
dep
(fl l
t 11 pl ♂? P furcatus β malesica *Kurz in Seem Journ Bot* v (1867) 102 —Singapore (*Kurz*) Sumatra, Java, &c

7 P LAEVIS *Rumph*, Kurz *For Fl* ii 508, arboreous or shrubby much branched 20–25 ft, branches rooting leaves elongate linear glaucous green 2–4 ft by 2 2½ in very acuminate without spines, male spadix very scented exactly as in *P odoratissimus* but margins and midrib of the white spathes quite unarmed, stamens racemosely connate, anthers mucronate, fruit unknown ? *Wall Cat* 8588 B —Burma, cultivated *Kurz*, ? Tavoy, *Wallich*—Descr from Kurz

Voy Bonite Bot t 21 —Nicobar Islds, *Fontana* Andaman Islds, *Kurz*

9 P LINNÆI, *Gaud Voy Bonite Bot* t 22, f 1 8, *Solms l c* 67 —India —Of this Solms remarks cf *P fascicularis* According to Gaudichaud s figure the drupes are very large 3 in long, in groups of 10 with rounded crowns and short stigmas grooved on one side, nothing is known of its origin

st gm ...
Solms l c 65 —Malacca
from Solms, who examine
fruits of it in the Kew I
long by 1–1½ diam, and remarkable for their glaucous surface

11 P OVATUS *Kurz in Journ As Soc Beng* xxxviii (1869) 147, *in Flora*, 1869, 451, a small species according to Gaudichaud s figure with leaves 18–24 by ¾ in, gradually narrowed into fine points and small globosely oblong terminal

fruits 2 in by 1½ in. diam, drupes with conical crowns passing into an upcurved subulate style Fisquetia ovata, *Gaud Bot Bonite Voy* t 4, f 1 —Malacca, *Gaudichaud*, Kedah Peak, *Lt -Col Low*

12 P POLYCEPHALUS, *Lam Wall Cat* 8583 A; leaves gradually finely acuminate, margins with stout distant incurved marginal spines in one specimen, and smaller closer ones in another fruits sprate resembling those of *P fœtidus*, carpels not in groups but drupes with rather longer spine cent crowns —Burma, at Amherst, *Wallich* —Lamarck's description of *P polycephalus*, found may apply to this

13 P TURBINATUS *Todd ex Steud Nom Ed* 2, ii 251 —"Ind Or"—Probably an undescribed plant of Lodidge's Catalogue

14 P YVANI, *Solms in Linnæa* xlii (1878) 20, leaves linear-lanceolate caudate-acuminate more than 12 in. long serrulate teeth pale, spathes concave elongate ovate, fem fl minute densely crowded narrowed into a simple upcurved shining spine —*Malacca, Yvan (Herb Delessert)* —The above characters (from Solms) are worthless for the identification of a *Pandanus*

15 PANDANUS sp, dwarf, stem about as thick as a swan's quill leaves 12–18

2 FREYCINETIA, *Gaud*

Characters, see p 483 —Species Malayan, Australian and Polynesian.

1 **F. angustifolia,** *Blume Rumph* i 159, t 43, leaves linear 12–18 by ¼–½ in finely acuminate margins smooth or minutely serrulate, spadices racemose, fem cylindric, filaments very short conic *Kunth Enum* iii 587, *Miq Fl Ind Bat* iii 17, *Kurz in Seem Journ Bot* v 134 *in part*, *Solms in Linnæa* xlii (1878) 81 F Brunoniana, *Wall Cat* n 3660 F Debregeseana *Gaud Voy Bonite Bot* t 37, f 1–11 —Pandaneæ, *Wall Herb* n 9124 (*not distributed*)

TAVOY, *Gomes*, PENANG, SINGAPORE and MALACCA, *Wallich*, &c —DISTRIB. Malay Islds

Diœcious *Stems* climbing, as thick as a goose quill *Leaves* grass like, costa very slender, nerves close set *Spadices* 3 ..., racemed on a short peduncle, males ½ 1 in by $\frac{1}{10}$–⅛ in diam, very dense fld, fem ¾–1 by ⅓–½ in diam, staminodes minute, stigmas 3–4, spathes ovate-lanceolate, finely acuminate

2 **F.** [illegible]
as in *F* [illegible]
elongate [illegible]

spathes, [illegible]
, in long,

3 **F. Walkeri,** *Solms in Linnæa*, xlii (1878) 92, leaves elongate linear-lanceolate finely acuminate margins spinulose towards the base 18–24 by ½–¾ in, spadices few in sessile umbels, fem very stoutly pedicelled oblong, anthers subsessile

CEYLON, *Walker, Thwaites*, CP 2333 ? ANDAMAN ISLDS, on Mt Harriet, *Kurz*

Stem as thick as the middle finger *Leaves* much longer broader and more coriaceous than in the preceding species *Male spadices* in bad condition, fem 1½–2 by ¾–1 in diam , pedicel as long

F. G [illegible] leaves 5–6 by [illegible] tip, spadices [illegible] spathes short [illegible] urz in Seem

MALACCA, *Maingay* (*Kew Distrib* 1537)

Stem as thick as a swan s quill *Leaves* coriaceous flat sheaths short, membranous *Spathes* 1½–2 in , cymbiform *Fem spadix* 1¼ by ½ in diam or more — The fem spadices appear longer stouter and upon much shorter pedicels than are represented in the figure cited but no dependence can be placed on drawings and descriptions of a succulent inflorescence made from dried specimens.

5 **F. insignis,** *Blume Rumph* 158 t 42 , leaves 1½–3 ft by ⅔–1 in , acuminate spinulose serrate on the margins and midrib beneath, spadices 2–3 peduncled erect, outer spathes greenish inner red fruit 2–4 in elongate oblong green berries free at the conical 3–5-cornered apex, stigmas 3–1 horse shoe shaped *Kunth Enum* iii 586 *Miq Fl Jung* i 166, *Fl Ind Bat* iii 170, *Kurz For Fl* ii 509

ANDAMAN ISLDS , *Kurz* —DISTRIB Java

A lofty sparingly branched climber —I have seen no specimens, the characters are from Kurz

ORDER CLXV **TYPHACEÆ.** By J D Hooker

Aquatic or marsh perennial herbs *Leaves* linear, erect or floating

Fruit small membranous or drupaceous *Seed* pendulous, albumen fleshy or floury, embryo axile, cylindric, radicular end thickened, plumule in a lateral slit —Genera 2, species about 15, cosmopolitan

Perianth of slender hairs . 1 TYPHA

Perianth of green scales . 2 SPARGANIUM

1 **TYPHA,** *Linn*

[illegible] *Flowers* in very dense superposed [illegible] with capillary bracteoles (hairs [illegible] hairs, or 0 in the male *Stamens* [illegible] *Ovary* (often reduced to a clavate tipped hair) very minute, on a long capillary stipes narrowed into a capillary style with a clavate or filiform stigma *Fruit* very minute, pericarp membranous indehiscent or laterally dehiscent, albumen floury — Species about 10, temp and trop

1 **T. elephantina,** *Roxb Fl Ind* iii 566, stem 6–12 ft, leaves [illegible] to above [illegible] *Kunth* [illegible] *Wien* [illegible] *Beng* xxxviii. i 146 T latifolia *Edgew in Proc Linn Soc* vi (1862) 194, *Kurz l c* T Maresii, *Batland in Bull Soc Bot Fr* 1887, 389

Marshes from N W INDIA to ASSAM and southwards —DISTRIB Algiers

Male spike 8 12 in, rachis clothed with short often forked hairs, bracts 3 or more, anthers [illegible] in long *Fem spike* much stouter 6–10 by ¼–1 in diam, flowers mixed with clavate pistillodes bracteoles with fasciate tips much longer than the hairs which are shorter than the stigmas

2 **T. javanica,** *Schnizl in Zolling Verz Ind Arch Pfl* 77, stem 4–6 ft, leaves ½–¾ in broad biconvex above the sheath, hairs of male fl simple forked or toothed, bracteoles with subspathulate tips and hairs shorter than the linear stigmas, fem fl mixed with pistillodes, pollen simple *Rohrb in Verh Bot Ver Brandenb* 1869, 98, *Kœrner in Verh. Bot Zool Ges Wien* xxxix 157 t v f 6 T angustifolia, *Thw Enum* 331 T latifolia, *Moon Cat Ceyl Pl* 81

CEYLON, *Thwaites*, &c —DISTRIB. Ms Mascarene and Malay Islands

A smaller plant than T elephantina, from which it differs in the form of the base of the leaf, simple pollen and linear stigma *Fem spike* 5–6 by ⅕–⅓ in diam *Anthers* ¼ in

3 **T. angustata,** *Chaub & Bory Exped Scient. Morec Bot* 338, stem 6–10 ft, leaves ¾–1 in. broad, semicylindric above the sheath, bracteoles of fem fl subspathulate equalling the linear stigmas, both longer than the hairs, fem fl mixed with clavate tipped pistillodes, pollen simple *Rohrb in Verh Bot Ver Brandenb* 1869, 81, *Boiss Fl Orient* v 50, *Aitchis in Trans Linn Soc* N.S iii 120 *Kœrner in Verh Bot Zool Ges Wien* xxxix 159 t iv f 6 v f 1 T angustifolia, *Kurz in Journ B t* v 95 (*excl syn*), *Roxb Fl Ind* iii 567, *Aitchis in Journ Linn Soc* xix 188, *Wall Cat* 4989

NORTHERN INDIA, from KASHMIR to MUNNIPORE and southwards to SCINDE and COROMANDEL —DISTRIB N Asia and westward, N Africa and S Europe

Closely resembles the common European *T angustifolia*, Linn, which is distinguished by the bracteoles shorter than the stigmas

4 **T. Laxmanni,** *Lepech in Nov Act. Acad Petersb* 84, 335 (*excl syn DC*), t 4, dwarf, 2–3 ft high, leaves slender semicylindric at the sheath, male spikes 1–2 in, fem ⅔–1 in by ⅙–⅓ in diam, fem fl ebracteolate mixed with pistillodes, hairs very short much shorter than the subobtuse stigmas, pollen simple *Kœrner in Verh Zool Bot Ges Wien* 167, t iv f 3, v f 15 T minima, *Kurz in Journ Bot* v 96 T Martini, *Aitchis in Journ Linn Soc* xix 188 T stenophylla, *Rohrb. in Verh Bot Ver Brandenb* 90, *Boiss Fl Orient* v 50

KASHMIR, alt. 9000 ft, *Thomson, Giles* —DISTRIB N Asia and westwards to Russia

At once distinguished from all the previous species by its small size and slender leaves, but very closely allied in the European and Oriental *T minima*, which, according to Kœrner, has bracteoles

2 SPARGANIUM, *Linn*

Flowers in globose unisexual heads, subtended by leafy bracts

Stem as thick as the middle finger *Leaves* much longer broader and more coriaceous than in the preceding species *Male spadices* in bad condition; fem 1½–2 by ¾–1 in diam, pedicel as long

4 **F. Gaudichaudii,** *Bennet, Pl Jav Rar* 31, t 9, leaves 5–6 by ⅔–⅚ in strict linear-lanceolate serrulate towards the caudate tip, spadices umbellate stoutly shortly peduncled, fem stout cylindric, spathes short fleshy *Kunth Enum* iii 102, *Miq Fl Ind Bat* ii 170, *Kurz in Seem Journ Bot* v (1867) 134, *Solms in Linnæa*, xlii (1878) 86

MALACCA *Maingay* (*Kew Distrib* 1537)

Stem as thick as a swan's quill *Leaves* coriaceous, flat, sheaths short, membranous *Spathes* 1½–2 in, cymbiform *Fem spadix* 1½ by ½ in diam or more — The fem spadices appear longer stouter and upon much shorter pedicels than are represented in the figure cited, but no dependence can be placed on drawings and *descriptions of a succulent inflorescence made from dried specimens.*

5 **F. insignis,** *Blume Rumph* 158, t 42, leaves 1½–3 ft by ⅔–1 in, acuminate spinulose serrate on the margins and midrib beneath, spadices 2–3 peduncled erect, outer spathes greenish inner red, fruit 2–4 in elongate-oblong green, berries free at the conical 3–5-cornered apex, stigmas 3–1 horse shoe shaped *Kunth Enum* iii 586, *Miq Pl Jung* i 166, *Fl Ind Bat* iii 170, *Kurz For Fl* ii 509

ANDAMAN ISLDS, *Kurz* —DISTRIB Java

A lofty sparingly branched climber —I have seen no specimens, the characters are from Kurz

ORDER CLXV **TYPHACEÆ.** By J D Hooker

Aquatic or marsh perennial herbs *Leaves* linear, erect or floating.

Perianth of slender hairs . . . . . 1 TYPHA
Perianth of green scales . . . . . 2 SPARGANIUM.

1 **TYPHA,** *Linn.*

[illegible] superposed [illegible] oles (hairs [illegible] *Stamens* [illegible] a clavate tipped hair) very minute, on a long capillary stipes, narrowed into a capillary style with a clavate or filiform stigma *Fruit* very minute, pericarp membranous, indehiscent or laterally dehiscent, albumen floury — Species about 10, temp and trop

[illegible]

1 **T. elephantina,** *Roxb Fl Ind* iii 566, stem 6–12 ft, leaves 1–1½ in broad trigonous above the sheath, margins often undulate above the middle, flowers bracteolate pollen 4 globate stigma lanceolate *Kunth Enum* iii 92, *Schnizl Typha* 2t *Kœrner in Verh Zool Bot Ges Wien* xxxix 165, t v, f 10 *Kurz in Journ Bot* v 95 *in Journ As Soc Beng* xxxviii i 146 T latifolia *Edgew in Proc Linn Soc* vi (1862) 194, *Kurz l c* T Maresii, *Battand in Bull Soc Bot Fr* 1887, 389

Marshes from N W India to Assam and southwards —Distrib Algiers

Male spike 8–12 in, rachis clothed with short often forked hairs, bracts 3 or more; anthers 1/6 in long *Fem spike* much stouter 6–10 by ¾–1 in diam; fl were mixed with clavate pistillodes bracteoles with fascicle tips much longer than the hairs which are shorter than the stigmas

2 **T. javanica,** *Schnizl in Zoll Rheg Verz Ind Arch Pfl* 77, stem 4–6 ft, leaves ½–¾ in broad biconvex above the sheath, hairs of male fl simple forked or toothed bracteoles with subspathulate tips and hairs shorter than the linear stigmas, fem fl mixed with pistillodes, pollen simple *Rohrb in Verh Bot Ver Brandenb* 1869, 98, *Kœrner in Verh. Bot Zool Ges Wien* xxxix 157 t v f 6 T angustifolia, *Thw Enum* 331 T latifolia, *Moon Cat Ceyl Pl* 81

Ceylon, *Thwaites &c* —Distrib Mascarene and Malay Islands

A smaller plant than *T elephantina* from which it differs in the form of the base of the leaf, simple pollen and linear stigma *Fem spike* 5–6 by ⅓–½ in diam *Anthers* ⅛ in

3 **T. angustata,** *Chaub & Bory Exped Scient Morée Bot* 338, stem 6–10 ft, leaves ⅓–1 in. broad, semicylindric above the sheath, bracteoles of fem fl subspathulate equalling the linear stigmas, both longer than the hairs fem fl mixed with clavate tipped pistillodes, pollen simple *Rohrb in Verh Bot Ver Brandenb* 1869, 81, *Boiss Fl Orient* v 50; *Aitchis in Trans Linn Soc* N S iii 120 *Kœrner in Verh Bot Zool Ges Wien* xxxix 153 t iv f 6 v f 1 T angustifolia, *Kurz in Journ Bot* v 95 (*excl syn*), *Roxb Fl Ind* iii 567, *Aitchis in Journ Linn Soc.* xix 188, *Wall Cat* 4989

[illegible] and southwards to Scinde [illegible] N Africa and S Europe [illegible] *latifolia*, Linn, which is dis- [illegible]

4 **T. Laxmanni,** *Lepech in Nov Act Acad Petersb* 84, 335 (*excl syn DC*), t 4, dwarf, 2–3 ft high, leaves slender semicylindric at the sheath, male spikes 1–2 in, fem ⅓–1 in by ⅙–¼ in diam, fem fl ebracteolate mixed with pistillodes, hairs very short much shorter than the subobtuse stigmas, pollen simple *Kœrner in Verh Zool Bot Ges Wien* 167, t iv f 3, v f 15 T minima, *Kurz in Journ Bot* v 96 T Martini, *Aitchis in Journ Linn Soc* xix 188 T stenophylla, *Rohrb in Verh Bot Ver Brandenb* 90, *Boiss Fl Orient* v 50

Kashmir, alt 9000 ft, *Thomson, Giles* —Distrib N Asia and westwards to Russia.

At once distinguished from all the previous species by its small size and slender leaves, but very closely allied in the European and Oriental *T minima*, which, according to Kœrner, has bracteoles

2 SPARGANIUM, *Linn*

Flowers in globose unisexual heads, subtended by leafy bracts

SERIES C *Flowers* hermaphrodite *Perianth* of 4–6 segments

Tribe VI ORONTIEÆ *Spadix* without an appendage

* *Spadix flowering downward, ovary* 1 *celled*

Prickly rigid herbs, spathe many times longer than the sessile spadix	27 LASIA
Prickly rigid herb spadix stipitate	28 PODOLASIA
Prickly rigid herbs spathes twice as long as the spadix	29 CYRTOSPERMA
Unarmed herbs leaves membraneous pinnate	30 ANAPHYLLUM

** *Spadix flowering upwards ovary* 1–3 *celled*

Stem scandent leaves distichous	31 POTHOS
Stemless, leaves ensiform spathe 0	32 ACORUS

1 CRYPTOCORYNE, *Fisch*

Aquatic or marsh herbs with creeping rootstock and short stem or 0 *Leaves* broad or narrow *Tube of spathe* with connate margins and a

erect orthotropous *Fruit* of coriaceous connate 2 valved many seeded carpels *Seeds* oblong albuminous, embryo axile—Species about 25 tropical Asiatic

* Tube of spathe narrow, longer than the limb (or as long in *C Griffithii*)

1 **C ciliata,** *Fisch ex Schott Melet* 16 leaves linear oblong or lanceolate limb of spathe oblong densely fimbriate *Kunth Enum* iii 12 *Schott*
Wight Ic t
Blume Rump
N E Br in
Ic Pl Asiat
Bot i 12
491

BENGAL in ponds &c (in salt marshes *Kurz*) MALACCA *Griffith* —DISTRIB Malay Isids

Tuberous stoloniferous *Leaves* 6–16 in, lower half sheathing midrib stout

2 **C. Walkeri,** *Schott in Bonpland* (1857) 271 *Prodr Aroid* 15 leaves long petioled oblong or oblong lanceolate base cuneate or rounded limb of spathe linear lanceolate strongly twisted glabrous *Engler Arac* 625 C *spiralis Thw Enum* 331

CEYLON *Walker*

Leaves 2 3 in acute thin, petiole 6 in, very slender *Scape* very short *Tube of spathe* 2 in, limb $1\frac{1}{2}$ in *Ovaries* 4–5

3 **C. retrospiralis,** [illegible] 10, leaves lanceolate to narrowly [illegible] both closely twisted. *Wight* [illegible] *od* 18, *in Bonpland* (1857) [illegible] mbrosinia retrospiralis, *Roxb Fl Ind* iii 492

BENGAL, BURMA, CENTRAL INDIA and the DECCAN

Leaves 3 12 by ¼–¾ in, narrowed into a short stout petiole, or sessile, finely acuminate, costa slender *Spathe* subsessile nearly as long as the leaves, deep green streaked with purple *Ovaries* 5–6, 3- or more-ovuled, stigmas orbicular

4 **C. consobrina,** *Schott in Bonpland* (1857) 222, *Prodr* 16, leaves oblong lanceolate finely acuminate petiole long, limb of spathe ovate long caudate glabrous not twisted *Engler Arac* 626

The DECCAN PENINSULA *Perrottet* &c

Leaves 4–6 by ¾ 1 in, midrib stout *Spathe* about equalling the petiole, its tail about three times longer than the blade

5 **C. cordata,** *Griff Notul* iii 138, *Ic Pl Asiat* t 172, leaves long-petioled broadly ovate or oblong ovate base cordate or emarginate, tube of peduncled spathe very long, limb small lanceolate not twisted glabrous *Schott Syn* 2, *Prodr Aroid* 14, *in Bonpland* (1857) 220, *Engler Arac* 626 & *Ic ined* No 6, *in Beccari Males* i 298, *N E Br in Journ Linn Soc* xiii 242

MALACCA, *Griffith* —DISTRIB Java, Borneo

Leaves 3–4 in, petiole usually much longer *Spathe* very variable in length (according to depth of water), tube 10 12 in, limb 1½ in, purplish green, base contracted, peduncle 2 3 in *Ovaries* 6–8, ovules many

6 **C. Griffithii,** *Schott Syn Aroid* 1, *Prodr Syst Aroid* 14, leaves broadly oblong or orbicular [illegible] tube of spathe a little lon[illegible] *Arac* 631 *N E Br in* [illegible] sp *Griff Notul* iii 139, *Ic* [illegible] (ovules)

MALACCA, *Griffith*

Leaves coriaceous, obtuse, base very various, rarely rounded sometimes 2-auricled, green above purple beneath, nerves obscure, petiole 6–8 in *Spathe* 2 2½ in, dark livid red and papillose within, and having a dimidiate hollow cone descending from the base of the convolute portion and enclosing the male fl *Fruit* ovoid, rugose, reddish, few seeded

7 **C. Beckettii,** *Thw ex Trim in Journ Bot* xxiii (1885) 269, leaves long petioled oblong lanceolate undulate base cordate, tube of small sessile spathe narrow straight about twice as long as the small tailed blade

CEYLON, Matale east, *Beckett*

Leaves 2½–4 in, subacute, 5–7-nerved, petiole 4–8 in *Spathe* not 1 in long, limb shortly tailed *Stipes* of male infl shorter than it *Carpels* 5 —Descr from Trimen

8 **C. Wightii,** *Schott Prodr Syst Aroid* 17, leaves narrowly linear narrowed at both ends strongly crisped and waved, tube of long peduncled spathe very long, limb lanceolate acuminate not twisted glabrous *Engl Arac* 627. C unilocularis, *Schott in Bonpland* 1857, 223 (*not of Kunth*)

MYSORE, *Wight.*

diam ; carpels in many cycles, free, about ½ in long Seeds several in each carpel, minute, basal

L. T

CEYLON, *Thwaites*

Rootstock branched *Leaves* 4–6 by ¾–1¼ in, base acute or rounded; petiole 2–6 in, rather slender, sheath short *Spathe* 1½–2 in, much longer than the peduncle, tube ovoid, appendage of spadix very short *Carpels* in 8 9 cycles, connate at the base—A much smaller species than *L toxicaria* The specimens are not very good

3. **L. lancifolia,** *Thw Enum* 334, petiole about equalling the lanceolate or ovate-lanceolate leaf, nerves diverging from the costa, spathe oblong beaked rugose within, tube obconic half as long as the limb *Engler Arac* 622 Cryptocoryne lancifolia, *Schott in Bonpland* 1857, 221, *Prodr Aroid* 15 (*in part*), *Gen* t 1

y beneath, base ple, appendage

4 **L. Kœnigii,** *Thw Enum* 334, leaves subsessile narrowly linear-

smooth *Seed* deeply grooved

5 **L. insignis,** *Trim Cat Pl Ceyl* 97, *in Journ Bot* 1 (1885) 269, petiole as long as the ovate lanceolate or oblong acuminate leaf, nerves very many and slender scurfily papillose divergent from the very stout costa, spathe very large, tube infundibular, limb very broad expanded abruptly caudate

CEYLON, Pasdun Korle, *Trimen*

Leaves 12 by 3–4 in, closely dotted beneath *Spathe* stoutly peduncled, tube 1½–2 in limb 4–6 in broad, drooping, crisped and undulate, membranous, purple with white veins (like an *Arisæma*)

3 PISTIA, *Linn*

A floating, gregarious, stemless, stoloniferous herb *Leaves* sessile, obovate cuneate, together forming an erect cup *Spathe* small, shortly peduncled, tubula
of the spathe, free
the apex of the
neuters below ther
conical, stigma di
Fruit membranor
testa at length rugose

P Stratiotes, *Linn Sp Pl* 963, *Roxb Cor Pl* iii 63 t 269 *Fl Ind* iii 131, *Griff Notul* 12 211, *Ic Plant Asiat* t 260 261, *Dalz & Gibs Bomb Fl* 281, *Bot Mag* t 4564—*Rheede Hort Mal* t 32

Throughout INDIA, and CEYLON, in still sweet water—DISTRIB tropics generally

Roots of tufted simple white fibres clothed with fibrillæ *Leaves* 1½–4 in long in Indian forms, apex rounded or retuse undulate, pubescent above and beneath; nerves raised beneath, flabelliform converging within the margin *Spathe* white, obliquely campanulate, ½ in long tomentose externally, gibbous and closed below, contracted about the middle, dilated and nearly circular above

4 ARISÆMA, *Mart*

Tuberous herbs *Leaves* 3-sect pedatisect or leaflets whorled *Spathe* deciduous, tube convolute limb often acuminate or tailed, usually incurved *Spadix* included or exserted, appendage various often excessively long and filiform *Male fl* many, stipitate (sessile and connate in a continuous stratum in *A flavum*), anthers 2–5 oblong or subglobose *Fem fl* densely crowded, ovary 1 celled style short or 0, stigma disciform, ovules 2 or more, basilar, orthotropous *Neuters* 0 or a few above the males or females, or on the appendage subulate *Berries* 1-few seeded *Seeds* albuminous, embryo axile—Species about 50, temp and trop Asia, and N America

The characters taken from the plants being mono or diœcious are not absolute but very constant, as are those of leaves one or two

A TRISECTA *Leaves* trifoliolate (Sp 1–17)

* Appendage much shorter than the limb of the spathe—Usually all diœcious

1 A. Roxburghii, *Kunth Enum* iii 18, leaves 2, leaflets ovate lanceolate caudate acuminate lateral subsessile median petiolulate limb of spathe ovate lanceolate acuminate incurved or involute, appendage very slender acute naked or with a few basal neuters *Schott Syn Aroid* 27, *Prodr* 33 A cuspidatum, *Engler Arac* 536 Arum cuspidatum, *Roxb Fl Ind* iii 506, *Wight Ic* t 784

PENANG *Roxburgh*; on Govt Hill, alt 2000 ft, *Curtis* PERAK, *Scortechini* *Kunstler*—DISTRIB Java (*Ic Horsfield*)

bears a few subulate neuters

2 A. Kunstleri, *Hook f*, leaf solitary, leaflets ovate or ovate lanceolate subcaudately acuminate all or the median only petiolulate, limb of the green spathe suberect ovate lanceolate acuminate about as long as the tube but broader, base dilated round the tube hardly recurved, male spadix very slender ending in a very slender naked finely acuminate appendage

PERAK *Kunstler* (*Ic in Herb Calcutt*) PENANG, *King's Collector* (1633), on Govt Hill, alt 2000 ft, *Curtis* ? KHASIA HILLS, Nya Bungalow, alt 2000 ft *Clarke*

Root tuberous *Petiole* and *peduncle* 4–10 in , slender, green, obscurely mottled with red *Leaflets* membranous, 3–6 in , lateral unequal at the base, median acute or cuneate at the base, margins sometimes obscurely erose (when dry) *Spathe* 2-3 in long —Very near *A laminatum*, Blume of Java, which has a white tube of the spathe, and the green limb is contracted at the base, and is not carried round the mouth of the tube

3. **A. album,** *N E Br in Journ Linn Soc* xviii 247, leaf solitary, leaflets petiolulate lateral dimidiate ovate median elliptic base cuneate or acute, tube of white spathe about as long as the ovate lanceolate acuminate limb, appendage filiform shorter than the spathe bearing towards the tip scattered subulate neuters Arisæma, *Wall Cat* n 8924

KHASIA HILLS alt 4000 ft *de Silva, Clarke*

Tuber depressed *Petiole* 10–12 in , lateral leaflets about 8 by 4 in , base very unequal, tips filiform median rhombic-ovate, petiolules ¾–1 in *Peduncle* about as long as the petiole *Spathe* 3–4 in , tip filiform margins below not revolute *Spadix* (female) with scattered neuters on the base of the appendage, besides those towards its tip

[illegible]

KHASIA HILLS, alt 4 5000 ft , *J.D.H & T T*, *Clarke* MUNNIPORE, alt. 8800 ft , *Watt*

Rootstock elongate, rooting all over *Petiole* and shorter peduncle slender, leaflets subequal, 6–10 by 2½–3½ in , lateral cuneate or unequal sided at the base, median with an acute base *Spathe* with a funnel shaped tube and purplish limb 5 in long, twice as long as the slender male spadix

5 **A. Wattii,** *Hook f* , leaves 2, leaflets subsessile finely acuminate, lateral dimidiate-ovate median elliptic-oblong, tube of spathe longer than the orbicular ovate caudate acuminate limb, appendage long stipitate stout cylindric naked top rounded.

MUNNIPORE , at Mao, alt 4000 ft., *Watt*

Petiole 8–10 in , leaflets 5–8 in , lateral 2–3½ in broad, inner half very narrow and evanescent below nerves many, strong *Peduncle* shorter than the petiole *Spathe* 5–6 in long, limb 2 in broad, margins below surrounding the tube and recurved *Appendage* 2½ in , ¼ in diam , stipes ½ in

6 **A. anomalum,** *Hemsl in Journ Bot* (1887) 205, leaves solitary, leaflets petiolulate ovate acuminate tips filiform limb of spathe broad ovate acuminate strongly incurved broader and rather shorter than the tube, appendage slender narrowed upwards naked *N E Br in Gard Chron* (1890) i 321, *Bot Mag* t. 7211

STRAITS OF MALACCA, Larut Islds , *Curtis* PERAK, alt. 2500–3500 ft , *Scortechini*, *King's Collector*

Rootstock deformed, lobed , lobes bearing solitary leaves or peduncles or both *Petiole* slender, green leaflets 4–6 by 1¾ in *Peduncle* shorter than the petiole, purplish green *Spathe* 2 in long, tube striped purplish-brown, limb dark brown purple, striped with white lower margin forming a broad recurved border round [illegible]

** Appendage much longer than the spathe, tapering into a very long filiform pendulous tip

† Appendage naked.

a Limb of spathe broad, rounded truncate retuse or 2-lobed —All diœcious

7 **A. verrucosum,** *Schott in Œstr. Bot Wochenbl* (1857) 341, *Prodr.* 29, leaf solitary, petiole sheath and peduncle warted, leaflets sessile rhomboidly orbicular or lateral ovate, limb of spathe very broad obcordate cuspidately acuminate decurved, base of appendage dilated into a lobed disc. *Engler Arac* 537

EASTERN TEMPERATE HIMALAYA, alt 8-11 000 ft, *J D H* *Clarke*

Tuber large, depressed *Petiole* 8–10 in, very stout, dull dark green, studded with minute warts, leaflets 2 7 in, dark purple beneath, margins waved purplish, nerves stout beneath *Peduncle* like the petiole *Spathe* 5–7 in, tube white closely striped with dark purple limb twice to five times as broad, reticulated with white and dark purple, apex ½-2 in long *Spadix* stout shortly stipitate, dark purple, base intruded narrowed above it into a fusiform body that tapers into an exserted thread 12 18 in long or more —Very near to *A utile*, from which the warted petiole and peduncle distinguish it The colours are taken from a drawing of my own, and no doubt vary much

8 **A. Griffithii,** *Schott Syn Aroid* 26, *Prodr* 54, leaves 2, leaflets sessile all rhombic orbicular acuminate crenate, limb of spathe ... tube which it overhangs deeply ...il that embraces the filiform tail ... *Clarke in Journ Linn Soc* xxi ... 350 ... *Bot Wochenbl.* (185... t 6, f 11-19. —P...

EASTERN TEMPERATE HIMALAYA, Sikkim, alt 7-10,000 ft BHOTAN, alt 3-5000 ft, *Griffith*

Tuber depressed, 3-5 in diam *Petiole* as thick as the middle finger, green, smooth, leaflets 6 10 in, sometimes broader than long, margins faintly yellow, nerves deeply sunk *Peduncle* much shorter than the petiole *Tube of spathe* 2–3 in, purple ribbed with white, limb 5 8 in broad, incurved, head rounded, lobes forming two broad dull violet flaps, reticulate with green; sinus 2–3 in deep, tail 2-4 in, purple *Spadix* stout, appendage purple, stipitate, suddenly narrowed from a broad disciform lobed intruded base into a tortuous capillary tail 1–3 ft long —Variable in colour and size Clarke observes that in ascending from 8000 to 12,000 ft the spathe varies from 6-8 in broad curved and ridged, to 1 in broad scarcely dilated with obscure ridges, but possibly other species were confounded with *Griffithii*

9 **A. utile,** *Hook f in Schott Prodr Aroid* 30, *Bot Mag* t 6474, leaves sol... leaflets sessile rhomb... ovate or obovate ... of ... ...ort ...*gler*

TEMPERATE HIMALAYA, from Kashmir, alt 7500 ft, *Clarke*, eastwards to ...

figure of the Bot Mag drawing

β *Limb of spathe lanceolate acuminate, or caudate*—Diœcious, except *A Prazeri*

10 **A. speciosum,** *Mart in Flora* (1831), 458, *in Wall Cat* 8923, leaf solitary, leaflets all petiolulate acuminate lateral dimidiate cordate median ovate nerves broadly reticulate, limb of spathe ovate lanceolate

t. 20

TEMPERATE HIMALAYA, from Kumaon, to Sikkim, alt 7–8000 ft, and Bhotan 9–10 000 ft, *Griffith*

Rootstock oblique or shortly creeping and rooting, often 5 in diam *Petiole* very stout, green smooth often marbled with brown or purple, leaflets 16–19 in, edged with red or purple, median cuneate or rounded at the base, petiolule

...*h* i 102, leaves 1 or 2, leaflets median elliptic base acute or of spathe lanceolate incurved dage substipitate subcylindric into a very long fusiform tip *Kunth Enum* iii 18, *Schott Syn Aroid* 27, *Prodr* 28, *Engler Arac* 540 A Stracheyanum, *Schott in Œstr Bot Zeitschr* (1857), 533, *Prodr* 27, *Engl l c* and *Ic ined* No 11 A dolosum, *Schott in Bonpland* (1859) 26, *Prodr* 28

TEMPERATE WESTERN HIMALAYA, alt 7–9000 ft, from Simla to Kumaon

A smaller plant than *A speciosum*, with more membranous sessile leaflets, the median of which is elliptic with a very acute base From *Wallichianum* it differs in the elliptic median leaflet The nervation at once distinguishes it from *A costatum* *A dolosum* and *Stracheyanum* in no way differ from *intermedium*

12 **A. Wallichianum,** *Hook f*, leaf solitary, leaflets sessile all

...disciform narrowed into a very long filiform tail A costatum, *Wall Cat* 8922 *non Mart* (not Arum costatum, *Tent Fl Nep*)

TEMPERATE HIMALAYA, from Simla, alt 6–8000 ft, to Sikkim, alt. 12–14 000 ft.

Tuber depressed *Petiole* 6–12 in, leaflets 3–8 in, and as broad, rather membranous *Peduncle* shorter than the petiole *Spathe* 3–8 in, narrow, striped with dark purple, limb subcrect or slightly incurved, much longer than the tube, tip filiform —The Sikkim specimens are much smaller than the Nepalese and western. A fine drawing of this made in Nepal by Wallich's native artists is in Kew Herbarium

13 **A. propinquum,** *Schott in Œstr Bot Zeitschr* (1857) 333, *Prodr Aroid* 29, leaves 2, leaflets sessile acuminate, lateral dimidiate-ovate, median rhomboidly orbicular base contracted subpetiolulate, nerves broadly reticulate limb of spathe oblong or lanceolate caudate acuminate, appendage stipitate fusiform above the dilated truncate lobulate base narrowed into a filiform shortly exserted tail A intermedium, *var.* propinquum *Engler Arac* 541

SIKKIM HIMALAYA, alt 12 000 ft *J D H*, *Clarke*

Pootstock depressed globose *Petiole* very stout, 8 in long, green, closely speckled and striate with dark green, leaflets 3–4 in long and broad, succulent, shining, nerves strong beneath lateral sheaths long irrorate with pink purple and green *Peduncle* about equalling the petiole *Spathe* very like *Wallichianum* and *speciosum*, limb suberect striped with purple on the sides, reticulate towards the top *Spadix* pink —Described chiefly from a drawing of mine The shortly exserted appendage seems to be a constant character and a great contrast to its allies. It has been regarded by Engler as a variety of *intermedium*, from which the two leaves and rhombic median leaflet distinguish it.

14 **A. costatum,** *Mart in Flora* (1831) ii 458, leaf solitary, leaflets sessile or subsessile lateral dimidiate cordate median broadly ovate all [illegible] of spathe [illegible] liform tip, [illegible] base then [illegible] 01, *Kunth Enum* iii 17, *Schott Syn Aroid* 26, *Prodr* 29, *Engler Arac* 541. Arum costatum, *Wall Tent Fl Nep* 28, t 19

NEPAL, *Wallich*

Tuber depressed, 3–4 in diam *Petiole* 12–18 in, very stout, sheath embracing [illegible]

15 **A. Prazeri,** *Hook f*, leaf solitary, leaflets ovate acute or acuminate, lateral subsessile median petiolulate, nerves very slender distant, tube of spathe short, limb much longer oblong lanceolate acute contracted at the base, appendage slender twice as long as the spathe, base not swollen

UPPER BURMA, *Kaw. I C Prazer.*

Rootstock tuberous *Petiole* 10–18 in, sheathing beyond the middle, or not; leaflets 3–4 by about 2 in, nearly symmetrical or lateral rather oblique with rounded or broadly cuneate bases, median more elliptic, less acute *Peduncle* longer or shorter than the petiole, slender. *Spathe* 3½ in, tube 1 in, limb apparently erect, about ¾ in broad *Male fl* very small, subsessile *Ovaries* minute, contracted into a short style with disciform stigma —A few male fl occur on the stipes of the appendage

16 **A. galeatum,** *N. E. Br. in Gard. Chron.* (1879) ii. 102, leaf solitary, leaflets all petiolulate, lateral dimidiate-ovate or -cordate acuminate crenulate, median elliptic or ovate, tube of green spathe cylindric top incurved galeate much longer than the ovate lanceolate acuminate pendulous limb the lower margins of which are recurved, appendage gradually narrowed from an elongate conic truncate base into a long thread *Bot Mag* t 6457

SIKKIM HIMALAYA, *Gammie (Hort Kew)*

Tuber small *Petiole* 1-2 ft, leaflets 7-14 in, median broadest, nerves broadly reticulate, petiolules 1 1½ in *Peduncle* much shorter than the petiole *Spathe* 4-5 in, striped with white, limb 1½ in, hanging half way down the tube *Spadix* white, appendage sessile in the fem, stipitate in the male, thread pale purple

†† Appendage of spadix far exserted bearing many neuters

... *Gard Chron (1884)* ii 680, f 119, ... ovate caudate acuminate, tube of ... erect or incurved ovate lanceolate ... filiform neuters *Regel Gartenfl.* ... *ourn of Hortic* 1886, f 19

... *(Hort Sander), Curtis* ... , leaflets 5-7 in nerves deeply sunk. ... about 6 7 in, tube 2½ in, striped green ... *Spadix* very slender throughout, appen... red-purple, base not swollen, neuters ... aries scattered amongst the lower flowers. ... *Gard Chron* is probably an error.

B PEDATISECTA *Leaves* pedatisect (Sp 18–22)

* *Appendage of spadix elongate, far exserted*

18 **A. tortuosum,** *Schott Meletem* i 17, *Syn* 29, *Prodr* 36, leaves 2–3, leaflets 5–18 sessile or petiolulate ovate- or linear-lanceolate ... spathe about as long as the large ... ndage narrowed from ... *Kunth Enum* iii 19, ... *ed* n 58 A curva... *Dalz & Gibs Bomb* ... *Ic ined* No 57 A. ... , *Engler l c.* and *Ic* ... *Prodr* 36 A commu... tum curvatum, *Roxb.* ... *Wall Pl As Rar* ii

TEMPERATE and SUBTROPICAL HIMALAYA, alt 8000 ft, from Simla to Bhotan The KHASIA HILLS, MUNNIPORE, the WESTERN GHATS, from the Concan to Malabar.

... *Petiole* 1-3 ft., green or with the ... , distant or crowded, or almost ... in, pale green or purplish, tube ... limb *Spadix* uni- or bisexual, ... common and varying greatly in stature, the numbers and proportions and breadth of the *leaflets, colour of the* spathe, and monoecious or dioecious flowers In *A Steudelii* there are a few neuters above the male fl The recorded Ceylon habitat is an error

19 **A. Wrayi,** *Hemsl in Journ Bot* (1887) 205, leaves 1–3, leaflets

t. 7105

PERAK, *Wray*, Larut alt 3 4000 ft, *Scortechini*

Tu er subgl bo c rootin, all over *Petiole* 12 18 in and petiolules mottled green and wh te and dotted w th red leaflets 6–10 by 1 2 in, dark green, median l ngest with petiolule 1 2¼ in *Peduncle* taller than the petiole, slender *Spathe* 5–7 in, erect, limb pale yellow green or lilac with darker stripes *Spadix* very slen ler fem with scattere l didymous bicuspidate anthers on long filaments on the base of the appendage *Stigma* penicillate

** *Appendage of spadix included or shortly exserted*

20 **A. decipiens,** *Schott in Œstr Bot Zeitschr* (1857) 373, *Prodr* 34, diœcious, leaves 2, leaflets 5–7 elliptic-lanceolate caudate-acuminate, lateral sess
tube of spathe as long
as the rest of the spa
truncate straight *L*
251

KHASIA HILLS alt 5–6000 ft, *Griffith*, &c

Rootstock horizontal rooting as th ck as the thumb *Petiole* 12 16 in, slender, sheaths very long mottle l leaflets 6 10 in petiolule of median 1–1½ in, lateral divaricate *Peduncle* shorter tl an the petiole *Spathe* 4 5 in, excluding the filiform tail which is 3 5 n doll purple, lower margins not recurved *Spadix* slender; appen lage stipitate cylindric, erect rather thickened towards the base, male fl subsessile —The Javan habitat is an error

21 **A. flavum,** *Schott Prodr* 40, monœcious, leaves 2, leaflets 9–11,
iolulate,
wice as
icluded,
Schott
le ined

No 7 Dochafa flava, *Schott Syn* 24, *Gen Aroid App* Arum flavum, *Forsk Fl Ægypt Arab* 157

TEMPERATE HIMALAYA and WESTERN TIBET, alt 5–9000 ft, from Kashmir to Kumaon CHUMBI, N E of Sikkim, *King s Collector* —DISTRIB Affghanistan, Arabia

Rootstock globose *Petiole* 8–12 in, sheath usually very long, leaflets 2–4 in *Spathe* 1–2 in, green, yellow, or the l mb faintly purple below *Spadix* conical,

between the Himalayan and Arabian specimens

22 **A. Scortechini,** *Hook f*, diœcious, leaf solitary, leaflets 3–5 lanceolate acuminate, lateral subsessile, median petiolulate, tube of spathe cylindric, limb ovate or ovate lanceolate erect, tip shortly filiferous, base dilated into two large rounded spreading auricles

PENANG, *Curtis* PERAK, *Scortechini*, *King s Collector*.

r, green, leaflets
Herb Calcutt),
ong, erect, white
purple, narrowly
to leaf, tapering into the erect naked yellow obtuse appendage

C RADIATISECTA Leaflets *whorled.* (Sp 23 to end)

* Spadix much longer than the spathe

23 **A. neglectum,** *Schott in Bonpland* (1859) 26, *Prodr* 36, monœcious, leaflets 4–7 sessile elliptic or oblanceolate cuspidately acuminate, tube of spathe cylindric base swollen, limb about as long oblong cymbiform acuminate top incurved, appendage twice as long as the spathe erect then porrect and again erect *Engler Arac* 534 A filiforme, *Thw Enum* 334 (*not of Bl*) A Wightii, *Bot Mag* t 5507 (*not of Schott*)

WESTERN GHATS, from the Concan to the Nilghiri hills, alt 6000 ft CEYLON, in the south part of the island *Thwaites, Huegel*

Tuber globose *Leaves* 1 or 2, petiole green or clouded leaflets usually broadest in the middle *Spathe* 3–4 in green limb open margins not recurved, base not dilated *Spadix* rather stout, appendage sessile, remarkably like that of *A tortuosum*

** Spadix not longer than the spathe

† *Diœcious (rarely monœcious) Fem spadix with neuters above the inflorescence*

24 **A. nepenthoides,** *Mart in Flora* (1831), 458, *in Wall Cat*

26, t 18

TEMPERATE HIMALAYA, alt 9–11,000 ft, Nepal, *Wallich*, Sikkim, *J D H*, &c

Tuber globose very large *Leaves* 2, petiole peduncle and tube of spathe dull yellowish clouded with dark streaks *Peduncle* shorter than the petiole *Spathe* 6–8 in, tube 2 3 in, cylindric, base not swollen, limb 4 in whitish with n, yellow without, auricles nearly 1 in broad green spotted with brown and with a broad purplish brown margin *Spadix* whitish appendage stipitate much shorter than the spathe, contracted in the middle *Ovaries* obovoid, contracted into a rather long style, stigma simple.—Lateral leaflets sometimes lobed at the outer base, showing a tendency to the pedate section

25 **A. Leschenaultii,** *Blume Rumph* i 93, leaflets 5–11 oblanceolate acuminate serrulate, tube of spathe cylindric as long as the suberect cymbiform long caudate acuminate limb appendage stout cylindric or slightly clavate tip rounded *Kunth Enum* iii 15, *Schott Syn Aroid* 30, *Prodr* 51 *Engler Arac* 5 2 A papillosum *Steud ex Schott Prodr* 46, *Thw Enum* 335, *Bot Mag* t 5196 (*excl syn* erubescens) ? A erubescens, *Dalz & Gibs Bomb Fl* 258 A Huegelii, *Schott Syn* 27, *Prodr* 44—Arisæma, *Wall Cat* 8921

WESTERN GHATS from the Concan southwards

Tuber large, globose *Leaf* solitary, petiole 1–2 ft, usually mottled and

banded with red and brown, leaflets 4 6 by 1½–2½ in *Spathe* 3 8 in, green with broad dark purple bands, tube narrow, l mb leaning forward, margi is below hardly recurved, tip straight obtusely acum nate, very variable in length *Spadix* 4 in, nearly cylindric throughout, hardly stipitate, neuter fl few short

26 **A. consanguineum,** *Schott in Bonpland* (1859) 27, *Prodr.* 52, leaflets about 15 (10
tips, spathe green, limb
lanceolate incurved with
appendage stout cylindri

TEMPERATE HIMALAYA alt 5–7000 ft. from Garwhal to S l kim KHASIA HILLS alt 4–6000 ft MUNNIPORE *Watt*

Tuber depressed globose 1 5 in d am *Leaf* solitary petiole 1–4 ft, often very stout and peduncle mottled dark p nk and red or brown leaflets 3 16 in, ½ 2 in broad, filiform tips 1–3 in *Spathe* 3–7 in, excluding the fil form tip, marg ns more or less recurved below *Spadix* hardly longer than the tube, appendage subsessile with a few neuters at the base

27 **A. concinnum,** *Schott in Bonpland* (1859) 27, *Prodr Aroid*
[illegible] acuminate,
o a very
usually
p clavate
l, *N E*
olt Il cc

TEMPERATE HIMALAYA alt 6–10 000 ft from Garwhal to Bhotan

Tuber globose *Leaf* solitary petiole 1 2 ft and pedun cle green or mottled with brown or purple, leaflets 8–12 in *Peduncle* shorter than the petiole *Spathe* green or purple str ped with white tube 2 3 in, limb as long or shorter open *Spadix* slender, sometimes monœcious, appendage exserted beyond tl e tube, fem with a few neuters at its base—Very near *A Leschenaultii*, differing in tl e slender appendage A small state from Sikkim, alt 10–11,000 ft, has more cuneately obovate cuspidately caudate leaves

28 **A. pulchrum,** *N E Br in Journ Linn Soc* xviii 252 t 6, leaflets 8–12 cuneately oblanceolate cuspidate, tube of spathe elongate cylindric below infundibular and gaping above limb broadly ovate suddenly narrowed into a decurved tail as long as the tube margins below revolute, appendage stout cylindric erect rather thickened below, tip rounded

INDIA (*Hort B U*)

it, clouded and speckled
e, subglaucous beneath
Spadix much shorter
ndage with an elongate

** *Diœcious* *Neuters* 0

29 **A. Jacquemontii,** *Blume Rumph* i 95, leaflets 5–7 elliptic or obovate lanceolate acuminate, tube of spathe narrow green, limb as long or longer oblong or ovate lanceolate incurved narrowed into a long acuminate erect or drooping tail, appendage elongate stipitate narrowed from the conical or truncate base to the slender forward curving tip *Decne in Jacquem Voy Bot* 168, t 168, *Kunth Enum* iii

except round the mouth of the tube *Spadix* narrowed from the base upward, appendage 1 1½ in, sessile, male fl scattered, with a few neuters above them

38 **A. caudatum,** *Engler Monog Arac* 559, leaflets 7 cuneately elliptic acuminate with long capillary tips, tube of spathe elongate cylindric limb incurved ovate lanceolate rather abruptly narrowed into a very long subulate tail margins below recurved, appendage rather short not thickened below included

The CONCAN *Stocks* (*Ic in Herb Kew*)

Tuber depressed globose *Leaf* solitary petiole stout and peduncle irrorately barred and streaked, leaflets petiolulate 5 by 2 in exclusive of the thread like tips which are 1 3 in long *Peduncle* very short *Spathe* 6 in, exclusive of the 3 in caudate tip *Spadix* androgynous, appendage shorter than the flowering portion, tip rounded —Described from a drawing by Stocks, I have seen no specimen

UNRECOGNIZED SPECIES

A? PENTAPHYLLUM *Schott Meletem* i 17 *Syn* 28 *Prodr* 59, *Kunth Enum* iii 20, *Blume Rumph* i 109, *Engler Arac* 560 Arum pentaphyllum, *Linn Sp Pl* 964 —Ind Or, China

A? HEPTAPHYLLUM *Blume Rumphia* i 109, *Kunth Enum* iii. 20 *Schott Syn* 31, *Prodr* 59, *Engler Arac* 560—Ind Or

5 SAUROMATUM, *Schott*

Tuberous herbs leafing after flowering *Leaf* solitary, pedatipartite *Spathe* shortly peduncled, tube cylindric short margins connate below, limb very long reflexed narrow open *Spadix* sessile very long male and fem infl widely distant, short, dense fld, with a few large clavate scattered neuters close above the fem, appendage slender, as long as the spathe *Anthers* subsessile, 4 celled *Ovaries* oblong 1 celled, stigma sessile, ovules 1–2, basal, erect *Berries* obpyramidal, 1-seeded — Species tropical Asiatic and African

S. guttatum, *Schott Meletem* i 17 *Prodr* 71, *Blume Rumph* i 126, *Engler Arac* 570 S pedatum *Schott Melet l c*, *Gen* t 11 *Syn* 24, *Prodr* 70 *Blume l c*, *Kunth Enum* iii 28, *Engler l c* 569, *Bot Mag* t [illegible] i *Schott Prodr* 71 S [illegible] *n Journ Linn Soc* xvii [illegible] (1858) i 263, *Prodr* 7[illegible] S punctatum, *C Koch* [illegible] *Br in Gard Chron l c* Arum guttatum *Wall Pl As Rar* ii 10 t 115 A pedatum *Willd Enum Suppl* 54, *Link et Otto Ic* 19 t 8 A sessiliflorum *Roxb Fl Ind* iii 507, *Wight Ic* t 800 A venosum, *Lindl Bot Reg* t 1017 A. clavatum, *Desf Cat Hort Par* 385

The PANJAB UPPER GANGETIC PLAIN and the HIMALAYA from Nepal to [illegible]

purple spots or blotches,
athe or nearly so; fem
ve the fem, ½ in long,
tuse or narrowed from
is confined to North-
n the Concan, of which
there is no evidence

6 ARUM *Linn*

Tuberous herbs *Leaves* simple *Spathe* deciduous or withering, tube convolute, limb cymbiform erect *Spadix* exserted androgynous, with subulate suberect neuters between the male and fem infl, and deflexed ones above the male, appendage subcylindric *Anthers* sessile, pollen vermiform *Ovary* 1 celled stigma sessile, ovules many on 2–3 parietal placentas *Berries* obovoid many seeded. *Seeds* albuminous, embryo axile —Species about 20, Europe, N Africa, W Asia

A. Jacquemontii, *Blume Rumph* i 118 leaves hastately sagittate or hastate limb of spathe narrowly lanceolate acuminate or caudate *Schott Prodr* 99 A Griffithii *Schott Syn* i 15, *Prodr l c*, *Boiss Fl Orient* v 38, *N E Br in Journ Linn Soc* xviii 257

N W India, *Jacquemont* Kashmir, Gilgit, alt 6–7000 ft, *Giles* —Distrib Affghan

Tuber as large as a chesnut. *Leaves* 5–12 in, petiole 5–16 in *Peduncle* equal long or longer than the petiole *Spathe* 3 7 in, white greenish or purplish *Ovaries* globose *Berries* red

7 TYPHONIUM, *Schott*

Tuberous herbs *Leaves* entire 3–5 lobed or pedatisect Tube of *spathe* short, convolute, mouth constricted, persistent, limb ovate oblong lanceolate or linear, deciduous *Spadix* exserted, male and fem infl distant with neuters above the fem and sometimes below the males, appendage elongate smooth *Anthers* subsessile *Ovaries* 1 celled; stigma sessile, ovules 1–2, basal erect, orthotropous *Berries* ovoid, 1–2-seeded. *Seeds* globose, albuminous, embryo axile —Species about 13, tropics of the Old World.

* *Limb of spathe broadly ovate, open, narrowed into a long point*

1 **T. trilobatum,** *Schott in Wien Zeitschr* iii (1829) 72, *Aroid* i 12, t 16, *Syn* 18, *Prodr* 108, leaves hastately 3 lobed or sub 3 partite, neuters above fem infl very many and long filiform curved, appendage
Blume Rumph i. 132
Arac 614; *in Bull Soc*
xviii 261. T orixense,
siamense *Engler l c*
lobatum *Linn Sp Pl*
965, *Thw Enum* 334, *Grah Cat Bomb Pl* 223 A orixense, *Roxb Fl Ind* iii 503, *Wight Ic* t 801, *Lodd Bot Cab* t 442 *Andr Bot Rep* t 356, *Bot Reg* t 450, *Griff Ic Pl Asiat* t 50 (*anal*) ? A pumilum, *Lamk Encyc* iii 8 ? Arisæma pumilum, *Blume Rumph* i 107, *Kunth l c* 20, *Schott Syn* 27, *Prodr* 59

Lower Bengal, Burma, the Eastern and Western Peninsula and Ceylon —Distrib Siam, Malay Islds

Cat n 8931 Arum cuspidatum, *Blume Cat Hort Buitenz* 101 A. flagelliforme *Lodd Bot Cab* t. 396, *Roxb Fl Ind* iii 502, *Wight Ic* t. 791, *Griff Itin Notes*, 13, No 193, *Griff Notul* iii 144 (flagelliferum) A angulatum *Griff Notul* iii 143 —*Rheede Hort Mal* ii t 20

10 **T. gracile,** *Schott Aroid* i 12 *Prodr* 108 leaves pedately 3-5 partite segments elliptic oblong acuminate lateral lobed at the outer base spathe very long and slender from a lanceolate base neuters above the fem infl filiform recurved or revolute appendage sessile as long as the spathe narrowed from the base to the very slender tip *Engler Arac* 613 Arum gracile *Roxb Fl Ind* iii 505 *Wight Ic* t 793 *Grah Cat Bomb Pl* 228 ? Arisæma gracile, *Kunth Enum* iii 21 —*Rheede Hort Mal* xi t 21

SILHET *Roxburgh* KHASIA HILLS *Griffith* (*Kew Distrib* 6000) —The PANJAB, Jhelum river *Aitchison*

Tuber globose *Leaves* 4–6 in broad across the segments which are sessile or petiolulate and from broadly oval to oblong or lanceolate acuminate, petiole 6–12 in, petiolules sometimes ½ in *Peduncle* 1 1½ in *Spathe* 6–8 in

8 THERIOPHONUM, *Blume*

Characters of *Typhonium* but leaves always undivided cordate or sagittate neuters all subulate anthers didymous and the more numerous ovules basilar and pendulous from the top of the ovarian cell —All Indian

* *Anthers beaked, opening by slits Neuters many all near the anthers*

1 **T. crenatum,** *Blume Rumph* i 128 spathe 4–5 in subcylindric margins waved and crenate anthers shortly beaked neuters ⅛–¼ in *Miq Fl Ind Bat* iii 196 *Schott in Œstr Bot Zeitschr* (1858) 2, *Aroid* i 15 t 21 *Prodr* 102, *Engler Arac* 607 (*excl var* rostratum), *N E Br in Journ Linn Soc* xviii 259 T Kleinii *Schott in Œstr Bot Zeit* 1858 *l c* 3 *Prodr* 103 Typhonium crenatum *Schott Melet* i 17 *Wall Cat* 8934 Arum crenatum *Wight in Hook Bot Misc* ii 100 *Suppl* t 3, *Grah Cat Bomb Pl* 228

The DECCAN CONCAN and CARNATIC *Heyne &c*

Tuber small *Leaves* 3 4 in long and often as broad orbicular hastate or cordately sagittate petiole 4–12 in *Spathe* membranous pale yellow green base of tube broadly truncate, intruded *Spadix* half as long as the spathe, appendage cylindric dark purple

2 **T Wightii,** *Schott in Œstr Bot Zeitschr* (1858) 3, *Prodr* 103 spathe 4–6 in linear oblong acute anthers long beaked lower neuters ¼ ½ in *N E Br in Journ Linn Soc* xviii 259 T crenatum *var* rostratum, *Engler Arac* 607 (*excl syn* arum crenatum) Typhonium minutum *Schott ex Wall Cat* 8932 (*not of Blume*)

The CARNATIC *Wight*

Very near *T crenatum* *Leaves* sometimes 3 lobed.—Specimens indifferent

3 **T. zeylanicum,** *N E Br in Journ Linn Soc* xviii 258, spathe 2½–3½ in, anthers globose shortly beaked, lower neuters twice as long as the upper Arum divaricatum, *Thw Enum* 334 (*excl syn*)

CEYLON, common in the hotter parts of the island, *Thwaites*
Leaves hastate, 3½–7 in long, lobes linear or median broader, petiole 4 12 in *Peduncle* 1½–4 in *Spadix* 1½–2 in. *Ovaries* few

** *Anthers not beaked, opening by pores Lower neuters near the ovaries, upper few or* 0

4 **T. Dalzellii,** *Schott Aroid* i 15, *Syn* 21, spathe 5–7 in *Engler Arac* 608 Tapinocarpus Dalzellii, *Schott Gen Aroid* t 15, *Prodr* 104 T indicus, *Dalz in Hook Journ Bot* iii (1851) 346

hast
and
dark
species

5 **T. infaustum,** *N E Br in Journ Linn Soc* xviii 260, spathe 1½–2 in T. Wightii, *Engl Arac* 608 (*not of Schott*) Calyptrocoryne Wightii, *Schott in Œstr Bot Wochenbl* (1857) 262, *Prodr* 105 *Gen Aroid* t. 16 Typhonium minutum, *Blume Rumph* i 134 *Engler, l c* 609 Arum minutum, *Willd Sp Pl* iv 484, *Grah Cat Bomb Pl* 228 A mucronatum *in part, Spreng Syst* iii 769—*Rheede Hort Mal* xi t 17 (*small figure*)

MALABAR (*Rheede*), Paul Ghat *Wight*
Leaves as in *T Dalzellii*, but smaller with the basal lobes usually rounded *Spathe* narrowly lanceolate, acute, white or purplish *Appendage* stipitate, base elongate conical

9 AMORPHOPHALLUS, *Blume*

Tuberous herbs flowering before leafing *Leaves* 3 partite, segments pinnatisect *Spathe* various, limb campanulate infundibular convolute or ... appendage large, short or ... contiguous, neuters 0 ... *Ovaries* globose or obovoid, ... –4 lobed, ovules solitary, ... obovoid *Seeds* exalbuminous, embryo macropodous—Species about 30–40, tropics of the Old World.

* Style many times longer than the ovary.

1 **A. campanulatus,** *Blume ex Decne in Ann Mus Hist Nat Par* iii (1834), 366 (*excl all syn but Roxb*), peduncle very short and petiole rough, spathe campanulate limb suberect or recurved waved and crenulate, spadix hardly longer than the spathe, appendage globosely conoid or amor ... *Dalz & Gibs Bomb Fl* 259, ... A Chatty, *Andre in Illust* ... *Br in Gard Chron* (1885) ... rghii, *Schott Melet* i 17 Arum campanulatum, *Roxb Cor Pl* iii 68, t 272, *Fl Ind* iii 509, *Wight Ic* t 785, and ? 782

PLAINS OF INDIA, from the PANJAB to BENGAL, the DECCAN, and CEYLON

Tuber a depressed bulbilliferous sphere 8–10 in diam *Leaves* 1–2, 1–3 ft broad, segments simple or forked, leaflets oblong, acute; petiole dark green with pale blotches *Peduncle* elongating [illegible]
the orb cul
with white
the base

the East for
any supposed
peared under

burgh's *Arum campanulatum*, and giving the same diagnosis as in Decaisne) a very much larger Javanese plant, with a widely expanded spathe and longer spadix with a long conico-ovoid appendage As Blume evidently all along [illegible]

[illegible] to it that Roxburgh alludes in speaking of large plants with the appendage 6 in diam

2 **A. Rex,** *Prain mss*, peduncle very short and petiole rough, spathe broadly campanulate with waved revolute margins, spadix much longer than the spathe, appendage elongate conoid sinuously waved A. campanulatus, *Blume Rumph.* i. 139, t 32, 33 (*excl syn*)

ANDAMAN ISL.
A very much
attaining nearly a

3 **A. dubius,** *Blume Rumph* i 142, petiole rough, spathe 3–5 in diam subsessile campanulate with a rather long oblong tube and ovate waved quite entire suberect or spreading limb, spadix shorter than the [illegible] *nth Enum* iii 32, *Arac* 310 Dracon. *t of Linn*) —*Hort*

Mal xi t. 18

l near-oblong stigma 2 fid —Described from the figure in Bot Mag Rheede s figure represents fem infl much shorter than in *A ca panulatus*

4 **A. longistylus,** *Kurz Andaman Rep* 50 (name), spathe long peduncled limb acute or acuminate hardly broa ler than the convolute ovoid tube appen lage cylindric narrowed to the tip many times longer than the infl. and spathe

ANDAMAN ISLDS Kurz

Tuber a depressed sphere not bulbilliferous *Leaf* very large leaflets 3–5 by 2 2½ in broadly ell ptic ovate or obovate base contracte l petiole 2–3 ft green spotted with purple sheaths closely wra p ng the base *Spathe* 13 by 5 in dull red purple with darker blotches sides infolding above the middle convolute low down *Spadix* ses ile infl. shorter than the spatl e m le ¼ in fem shorter appen lage 7 in dark v olet purple *Anthers* very short —Described from a draw ng in *Herb Calcutt*

** Style very short or 0

† *Spadix not or very little lon jer than the spathe*

5 **A. bulbifer,** *Blume Rumph* i 148 spathe long peduncled tube broad turgid limb rather longer ovate cymbiform obtuse, spadix very stout shorter or a little longer than the spathe appendage as long as infl and broader than elongate conoid or oblong top rounded *Kunth Enum* iii 34, *Regel Gartenfl* (1871) t 688, *Engler Arac* 317, and *Ic ined* No 156 Arum bulbiferum *Roxb Fl Ind* iii 510 *Bot Mag* t 2072 2508 *Grah Cat Bomb Pl* 229 *Wall Cat* 8935 8936 (spathe) A occultatum *and* taccoides *Herb Ham* Pythonium bulbiferum *Schott Melet* i 18 Conophallus bulbifer *Schott Syn* 34 *Gen* t 30, *Prodr* 128

EASTERN BENGAL SIKKIM the KHASIA HILLS and BURMA ascending to 5000 ft The CONCAN *Graham*

Tub
and ner
8–10 in
p nk or
by ½ d
2 lobed

6 **A. commutatus,** *Engler Arac* 319, spathe long peduncled erect

[illegible]

The CONCAN *Stocks*

Tuber and *leaf* unknown *Peduncle* 1 3 ft *Spathe* 6 10 by 1½–4 in, rough at the base within tip obtuse *Spadix* columnar sessile male infl 1½–2 in fem ½ 1½ in, both cylindric appendage not contracted above the infl, smooth, tip obtuse *Anthers* very shortly oblong *Stigma* sessile disciform

7 **A. purpurascens,** [illegible]

[illegible]

with

applies to Roxburgh's species In 18? burgh's *Arum campanulatum*, and a very much larger Javanese ... with an ovate ob spadix with a long conico-ov... ound the mouth of the infl. believed that he was dealing w... spathe, appendage fusiformly cono and limit the Indian species ... scattered diagnosis, and accept Dr ... (No 111), *Kunstler* being also a native of ... bulbiferous at top of petiole, green, shaded Ind Flora Wight ... 7, shortly petiolulate, 6–8 by 1¼ in, oblanceolate, latus, one, t 785 ... 2½ in, sheaths longer, linear *Spathe* 5 in; tube 1¼ in, campanulate spat... with purplish brown *Spadix* 3½ in *Anthers* minute, very *A Rex*, but wit... globose, style very short, stigma capitate Wight says he ... to it that R... much longer than the spathe diam

2 A... oncophyllus, *Prain mss* spathe ... spathe ... large orbicular ovat... lon car

... 3½ ft broad, leaflets 6–8 in, *Peduncle* 12–15 in, fruiting ... spathe 3 in long and broad, whitish, obliquely streaked with green and spotted with dull green, limb 8 in long by 8 broad, inclined, dull red-purple blotched with yellow *Spadix* 8–18 in, sessile, male infl about equalling the fem, appendage creamy-yellow *Anthers* short *Stigma* 2 lobed — A superb species, described from a drawing, dried specimen and a living plant at Kew

11 **A. Prainii,** *Hook f*, spathe obliquely campanulate tube very broad subcylindric base truncate, limb short orbicular ovate margins waved, spadix very stout, exserted appendage very large conoid smooth much longer and broader than the infl

PERAK ... (ew) ... lets 4–8, lanceo white and red ... 4 in, ... *Tube* (or rather convolute parts) of spathe 2 in long and as broad, pale green spotted with white, limb 6–8 in diam, yellow, base within rough purple-brown *Male* infl (subturbinate, fem about as long, appendage 6–8 in by 2–3 diam cream-colrd smooth *Anthers* linear *Stigma* 2 lobed —Spathe and spadix more like *A campanulatus* than are others with short styles

spadix apparently mottled, tube 1¼ in diam, base

ally is perhaps Blume's *A variabilis*

IMPERFECTLY KNOWN AND EXCLUDED SPECIES

A GIGANTEUS, *Blume Rumph* i. 147, t 34, is not British Ind ference under it to *Dennst Clav Hort Mal* and *Rheede Hort* struck out

A LYRATUS, Engler Arac 319 (Arum lyratum, *Roxb Fl Ind* i phallus lyratus, *Schott Syn* 35, *Prodr* 130) is according to Roxbur *Tacca pinnatifida*, with the detached berry of an *Arisæma?*

A TUBERCULIGER *Engler Arac* 317, tuber small leaf 3 sect, branch pinnatifidly or pinnatisectly 3–5 foliolate segments 3–4 by 1–1¼ in. sessile lanceolate caudate acuminate petiole 10–12 in bearing a pisiform bulbil at Conophallus tuberculiger *Schott Bonpland* (1859), 78, *Prodr* 129 —Khasia alt 3–4000 ft *J D H* and *T T* —Described by Schott from leaves only has added a description of the spathe of *A bulbifer*, from the drawing of a Sikkim specimen of that plant which he supposed to be the same

10 SYNANTHERIAS, *Schott*

Characters of *Amorphophallus*, but male and fem. infl distant, with oblong depressed interposed neuters

striate; wrapped at the base by short sheaths *Spathe* (perhaps immature) 3 in, dark green, blue at the sides with red margins *Spadix* 3 in, infl cylindric, stout, male the longest; appendage nearly 2 in, not contracted at the base, white *Anthers* very short *Stigma* sessile, disciform, lobulate

8 **A. chlorospathus,** *Kurz mss*, leaflets linear, spathe cymbiform erect base shortly convolute, spadix shorter than the spathe stout, appendage rather longer but not broader than the infl stout elongate conoidal tip rounded

PEGU, the IRAWADY and SITANG VALLEYS, *Kurz*

Tuber a depressed sphere or hemisphere, 2 in diam, not bulbilliferous *Leaf* 2 ft diam, trisect, segments winged and pinnatifidly cut into finely acuminate leaflets 5–8 by ½–¾ in; petiole 18–20 in, green *Peduncle* 16 in, stout green pale reddish brown below; sheaths not long *Spathe* 4 in, green, paler within *Spadix* 2½–3 in, infl cylindric, male longest; appendage not contracted at the base, white *Anthers* very short *Stigma* sessile, discoid

9 **A. sparsiflorus,** *Hook f*, spathe with an ovate oblong suberect acute limb the basal margins revolute round the mouth of the infundibular tube, spadix much shorter than the spathe, appendage fusiformly conoid as long as the infl, male and fem fl scattered

PERAK, Maxwell's Hill, *Wray* (No 111), *Kunstler*

Tuber orange-shaped *Leaf* bulbiferous at top of petiole, green, shaded with red or brown, leaflets 7, shortly petiolulate, 6–8 by 1½ in., oblanceolate, acuminate *Peduncle* 1–2½ in, sheaths longer, linear *Spathe* 5 in, tube 1½ in, pale red brown spotted with purplish brown *Spadix* 3½ in *Anthers* minute, very short *Ovaries* small, globose, style very short, stigma capitate

†† *Spadix much longer than the spathe*

10 **A. oncophyllus,** *Prain mss*, spathe long peduncled tube ovoid dilating into a large orbicular ovate limb the lower margins of which are revolute round the open mouth of the tube, spadix far exserted, appendage as long as the infl elongate conoid

[illegible] f 3½ ft broad, leaflets 6–8 in, [illegible] *Peduncle* 12–15 in, fruiting [illegible] 3 in long and broad, whitish, obliquely streaked with green and spotted with dull green limb 8 in long by 5 broad, inclined dull red-purple blotched with yellow *Spadix* 8–18 in, sessile, male infl about equalling the fem, appendage creamy-yellow *Anthers* short *Stigma* 2 lobed —A superb species, described from a drawing, dried specimen and a living plant at Kew

11 **A. Prainii,** *Hook f*, spathe obliquely campanulate tube very broad subcylindric base truncate limb short orbicular ovate margins waved, spadix very stout exserted appendage very large conoid smooth much longer and broader than the infl

PERAK, Larut, *Scortechini Kunstler* PENANG (*Ic in Herb Kew*)

Tuber 6–10 in diam, not bulbilliferous *Leaves* 4 ft broad leaflets 4–8, lanceolate, caudate acuminate petiole 3–5 ft, green mottled with grey, or white and red *Peduncle* 3–5 in, sheaths very large, 8–12 by 4 in, pinkish *Tube* (or rather convolute parts) of spathe 2 in long and as broad, pale green spotted with white, limb 6–8 in diam, yellow, base within rough purple-brown *Male* infl subturbinate fem about as long, appendage 6–8 in by 2–3 diam cream-colrd smooth *Anthers* linear *Stigma* 2 lobed —Spathe and spadix more like *A campanulatus* than are others with short styles

12 **A. burmanicus,** *Hook f*, spathe broadly ovate from a short tumid oblong tube erect, spadix far exserted, appendage ovoid or cylindric-ovoid much shorter than the male infl

BURMA, on the Karen Hills alt 3000 ft, *Kurz*

Peduncle 4–6 in, much longer than the sheaths *Spathe* 4–5 by 3–4 in., nearly smooth within, tube 1½ in long *Spadix* 3–6 in, male infl 1–2 in, fem ½ 2 in; appendage 1½ in, anthers short, prismatic *Ovaries* depressed-globose, with a short stout style, stigma large quite entire —Tuber and leaf wanting

13 **A. hæmatospadix,** *Hook f*, spathe campanulate convolute [illegible] eolate obtuse erect [illegible] tube nearly to the [illegible] three times as long as [illegible]

PENANG? *Curtis* (*Hort Kew*, 1892)

Tuber shortly turbinate, 2½ in diam Leaf about 20 in diam, leaflets [illegible]

Ovary globose, narrowed into a short rather slender style, stigma small, [illegible]

14 **A. elatus,** *Hook f*, peduncle very tall rough, spathe [illegible] margins not revolute, [illegible] stout, appendage [illegible] below the middle [illegible]

MALAY PENINSULA Larut, Perak, *Kunstler*

Tuber and *leaves* unknown *Peduncle* 3–4 ft, and [illegible] brown white and red *Spathe* 6 in cream colrd, membranous, [illegible] spadix, apparently mottled, tube 1½ in diam, base rounded [illegible] rather narrowed towards the base, about ½ in diam in the th[illegible] light blue, male infl 3 in, fem 1¾ in *Anthers* small, [illegible] globose, style very short stout, stigma capitate —A stately [illegible] taken from Kunstler's notes The specimen is unique in Herb [illegible] ally is perhaps Blume's *A variabilis*

IMPERFECTLY KNOWN AND EXCLUDED SPECIES

A GIGANTEUS, *Blume Rumph* i 147, t 34, is not Br[illegible] ference under it to *Denst Clav Hort Mal* and *Rheede* [illegible] struck out

A LYRATUS, Engler Arac 319 (Arum lyratum, *Roxb* [illegible] phallus lyratus, *Schott Syn* 35, *Prodr* 130) is accord[illegible]

has added a description of the spathe of *A bulbifer*, from [illegible] specimen of that plant which he supposed to be the same [illegible]

10 SYNANTHERIAS, *Schott*

Characters of *Amorphophallus*, but male [illegible] oblong depressed interposed neuters.

RHAPHIOPHALLUS, *Schott Gen. Aroid* t. 27; *Syn* 125, *Engler Arac* 321, would appear from the characters given not to be separable from *Synantherias*. It was founded on a Canara plant collected by Hohenacker, of which I have seen no specimen, and is described and figured as having a few gibbous neuters, and a slender subulate appendage shorter than the spathe. In other respects it agrees with *S. sylvatica*.

S. sylvatica, *Schott Gen. Aroid* t. 28; *Prodr.* 176, *Engler Arac* 320, [illegible]
Kunt [illegible]
Rum [illegible]
Scho [illegible]
ticum [illegible]

The DECCAN PENINSULA, from the northern Circars to the Concan, and southwards to CEYLON.

Tuber subglobose, bulbilliferous. *Leaves* 1 or 2, 1½–2½ ft. diam.; divisions 1–2-pinnatifid, leaflets 2–6 in., lanceolate, long-acuminate, petiole and peduncle 1–2 ft., and spathe clouded barred and streaked with green and pale pink. *Spathe* 2–4 in., tube broad convolute, base truncate, limb very short, ovate, acute. *Spadix* [illegible]

11. THOMSONIA, *Wall.*

Characters of *Amorphophallus*, but appendage clothed below with depressed neuters and all over above with tubercles.

T. nepalensis, [illegible] 150; *Engler Arc* [illegible] lichianum, *Schot* [illegible] *Enum.* iii 30. Ar[illegible]

TROPICAL HIMALAYA, Nepal, *Wallich*, Sikkim, alt. 2–6000 ft., *J. D. H.* ASSAM [illegible]

[illegible]

12. PLESMONIUM, *Schott.*

Characters of *Amorphophallus*, but male and fem. infl. distant, with large obovoid pearl-like or turbinate neuters interposed, and no appendage.

P. margaritiferum, *Schott Syn* 34; *Gen* t. 26; *Prodr.* 124; *Engler*

Arac 303 Amorphophallus margaritiferus, *Kunth Enum* iii 34 Arum margaritifer, *Roxb Fl Ind* iii 512, *Wight Ic* t 795 Caladium discretum, *Herb Ham*—*Wall Cat* 8937 A

HINDOSTAN, *Roxburgh* BENGAL, at Dacca, *Clarke*

Tuber 6 in diam or less, bulbilliferous all over *Leaves* 1½ ft diam, 3-sect, segments pinnatisect, lateral forked, leaflets few, 4–6 in, linear, acuminate, petiole 1½–2 ft, green *Peduncle* 12–18 in, stout pale green streaked with darker green *Spathe* 5–6 in by 4 broad, erect, broadly ovate, obtuse, concave, loosely convolute below the middle pale yellow green flushed with pink within, dark purple at the base *Spadix* very stout, stipitate obtuse as long as the spathe, male infl. much the longest, neuters as large as peas white *Anthers* crowded, very short, pores confluent *Ovaries* scattered, globose, narrowed into a short style, stigma large, 2 3 lobed —*P dubium*, Schott (*Prodr* 125 *Engler Arac l c*) founded on a very imperfect spathe and spadix from Pegu (*McLelland*) is distinguished by its anther by the neuters being (in a dried state) turbinate with acute margins all round

13 ARIOPSIS, *Nimmo*

Small tuberous herb *Leaves* entire, peltate *Spathe* small, cymbiform, open (tube 0) persistent *Spadix* shorter than the spathe, appendage 0, male fl cylindric, fem adnate to the base of the spathe *Male fl* embedded in the tissue of the spadix, anthers connate in groups of 3, each [illegible] en *Ovaries* few, oblong, [illegible] rthotropous, 2 seriate on [illegible] seeded, stigmas stellate [illegible]

[illegible]

botanist

1 **A. peltata,** *Nimmo in Grah Cat Bomb Pl* 252, *Schott Syn* 40, *Gen* t 85 *Prodr* 135, *Bot Mag* t 4222, *Engler Arac* 528 A protanthera, *N E Br in Rep R Gard Kew*, 1877, 57 Remusatia vivipara, *Wight Ic* t 900 (*not of Schott*) Caladium? ovatum, *Herb Ham*—Aroid *Wall Cat* 8956 8957

WESTERN SUBTROPICAL HIMALAYA, from Nepal to Sikkim, alt 4–6000 ft BURMA, in the Karen Hills, *Kurz* WESTERN GHATS, from the Concan to Travancore, *Heyne, &c*

Tubers small, clustered *Leaves* 1–6 in diam, orbicular or cordate, tip [illegible]

character

14 STEUDNERA, *C Koch*

Herbs, caudex stout *Leaves* ovate, long-petioled, peltate *Spathe* shortly convolute at the base, limb ovate lanceolate, expanded, reflexed, marcescent *Spadix* very short, dense fld., male infl. clavate or capitate,

f m adnate below to the spathe Stamens 3-6, connate in a peltate body with a flat crenulate crown anther cells globose Ovaries mixed with clavate staminodes subglobose 1 celled, stigma 4-5 lobed, ovules many, parietal orthotropous —Species 6 or 8 Indian and Burman

1 **S. discolor,** *Hort Bull* (*Cat* 1875 No 75), leaves 10-12 in ovate acute w ... blotches between the nerves, base retuse, spathe 4½ in ovate ac ... S colocasiæfol ... S co ... t. 2201)

INDIA *Hort Bull*

Stem short stout, clothed with brown sheaths *Leaves* dark green above, paler with dark blotches beneath *Spadix* 1¼ in, pale, staminodes 4-5 clavate

2 **S. colocasiæfolia,** *C Koch in Œstr Bot Wochenschr* (1862), ... retuse, spathe 6 in ... dark purple within ... (1869), 323, t 633, *Schott* ... *Hortic* xix 33 t 90, *Bot Mag* t 6762, *Engler Arac* 452, and *Andre Ill Hortic* ... *Ic ined* No 141 (excl *var* discolor and *Hab* Burma, and *Syn* Gonatanthus)

MARTABAN and the Karen Hills, *Kurz*

Closely allied to *S discolor* but a larger coarser plant with stronger nerves, a longer differently coloured spathe, and fewer staminodes

3 **S. assamica,** *Hook f*, leaves 7-8 in ovate oblong acute base rounded, spathe 3-3½ in lanceolate caudate acuminate red purple on both surfaces Aroid *Wall Cat* 8953

ASSAM, Duphla Hills, *Lister* (*Ic in Herb Calcutt*) CACHAR, *Keenan*

Caudex as thick as the thumb fibrous above *Leaves* bright green, paler beneath, petiole 6-8 in, slender *Peduncle* 3-5 in *Spathe* erect *Spadix* ¾-1 in, male infl cylindric —Wallich s specimen is without locality

4 **S. Griffithii,** *Schott in Bonpland* (1862), 222, leaves 4-5 in ovate oblong ...

... swan s quill

Le ... , male infl cyl ...

5 **S. colocasioides,** *Hook f*, leaves 19-24 in broadly ovate acute base broadly retuse spathe 5-9 in narrowly lanceolate acuminate tube convolute limb creamy yellow, fem infl half free Aroid *Wall Cat* 8944, 8947

SIKKIM HIMALAYA, *King* (*Ic in Herb Calcutt*) SILHET, *De Silva* CACHAR, *Keenan* (*Hort Kew*)

Caudex elongate, 1½ in diam, fibrous above *Leaves* thin in texture, light green above, glaucous beneath, petiole 12-18 in, green *Peduncles* several, 5-7 in *Spathe* erect, tube 1 in, ovoid, green; limb membranous *Spadix* 2 in, fem infl cylindric above the middle; male as long as the fem, cylindric *Ovaries* globose; staminodes very minute, clavate?—Very different from its congeners in size and spathe

6 **S. capitellata,** *Hook f*, leaves 8–9 by 7–8 in orbicular-ovate subacute base broadly retuse spathe 3½–4 in pendulous from the decurred peduncle lanceolate acuminate yellowish brown without pale purple and striated within, male infl globose

BURMA, in evergreen forests Tonkyaghet *Kurz* (*Ic in Herb Calcutt*)

Caudex as thick as the little finger densely fibrous sheaths 4 in *Leaves* pale green above, paler beneath, nerves about 5 pairs strong arched, petiole 1 ft, slender *Peduncles* many (4 in the drawing) 4 5 in, very slender *Spadix* ½–1 in, fem infl very long

15 HAPALINE, *Schott*

Small tuberous herbs *Leaves* membranous cordate or sagittate *Spathe* long peduncled tube cylindric decurrent tightly convolute, limb lanceolate or linear oblong flat *Spadix* equalling the spathe, male and fem infl remote, male elongate, fem adnate to the spathe, of few uniseriate ovaries *Male fl* an elongate hexagonal peltate shortly stipitate body, with 4–6 minute globose anther cells pendulous from its margin. *Ovaries* ovoid, 1 celled, 1 ovuled, stigma disciform, ovule erect, anatropous

1 **H. Benthamiana,** *Schott in Œstr Bot Wochenbl* (1857), 85, *Prodr* 162, leaves oblong sagittate basal lobes narrow obtuse more than half as long as the anticous spathe acuminate, *Engler Arac* 489, *Kurz in Journ As Soc Beng* xlii ii (1873) 109, t 9 Hapale, *Schott Gen Aroid* t 44—*Aroid Wall Cat* 8953 A

BURMA, banks of the Attran river *Wallich* PEGU and MARTABAN, in dry forests *Kurz*

Tuber small *Leaves* few, 3 4 in long, sinus deep, narrow, petiole and peduncle slender *Spathe* 2–3 in long, membranous white

2 **H. Brownii,** *Hook f*, leaves ovate acuminate deeply cordate, basal lobes rounded ⅓rd the length of the anticous, spathe oblong apiculate

he leaf and
Herbarium

(See p 490)

16 REMUSATIA, *Schott*

Tuberous *herbs* flowering and leafing in alternate years? bearing long radical bulbilliferous shoots *Leaf* solitary, entire peltate *Spathe*

sessile, disciform, placentas parietal, ovules many, orthotropous *Berries* small. *Seeds* albuminous, embryo axile

1 **R. vivipara,** *Schott Melet* i. 18, *Syn* 43, *Gen Aroid* t. 36, *Prodr* t 137, in *Ann Gand* (1846), t 66, bulbilliferous shoots very stout suberect or ascending simple or very shortly branched, limb of spathe

fem adnate below to the spathe *Stamens* 3–6, connate in a peltate body with a flat crenulate crown, anther cells globose *Ovaries* mixed with clavate staminodes, subglobose, 1 celled, stigma 4–5 lobed, ovules many, parietal, orthotropous —Species 6 or 8, Indian and Burman

1 **S. discolor,** *Hort Bull* (*Cat* 1875, No 75), leaves 10–12 in ovate acute with dark blotches between the nerves base retuse, spathe $4\frac{1}{2}$ in ovate acuminate golden yellow on both surfaces, base within purple S colocasiæfolia, *Hook f Bot Mag* t 6076 (*copied in Fl des Serres,* xxi t 2201) S colocasiæfolia, var discolor, *Engl Arac* 452

INDIA *Hort Bull*

Stem short stout, clothed with brown sheaths *Leaves* dark green above, paler with dark blotches beneath *Spadix* $1\frac{1}{2}$ in, pale, staminodes 4 5, clavate

2 **S. colocasiæfolia,** *C Koch in Œstr Bot Wochenschr* (1862), 114, leaves 10–12 in ovate acute concolorous base retuse spathe 6 in lanceolate [illegible] within [illegible] t 633, [illegible] 2, and [illegible] Gona tanthus)

MARTABAN and the Karen Hills *Kurz*

Closely allied to *S discolor*, but a larger coarser plant, with stronger nerves, a longer differently coloured spathe, and fewer staminodes

3 **S. assamica,** *Hook f*, leaves 7–8 in ovate oblong acute base rounded, spathe 3–$3\frac{1}{2}$ in lanceolate caudate-acuminate red purple on both surfaces Aroid. *Wall Cat* 8953

ASSAM, Duphla Hills, *Lister* (*Ic in Herb Calcutt*) CACHAR *Keenan*

Caudex as thick as the thumb fibrous above *Leaves* bright green, paler beneath, petiole 6–8 in, slender *Peduncle* 3–5 in *Spathe* erect *Spadix* $\frac{3}{4}$–1 in, male infl cylindric —Wallich s specimen is without locality

4 **S. Griffithii,** *Schott in Bonpland* (1862), 222, leaves 4–5 in ovate oblong acute or cuspidate base emarginate or shortly 2 lobed, spathe 2–3 in ovate lanceolate acuminate yellowish green on both surfaces brown purple below the middle within Gonatanthus Griffithii, *Schott Prodr.* 143—Arum sp *Griff Notul* iii 144, *Ic Pl Asiat* t 164, *f* 1

UPPER BURMA, *Griffith*, at Namtuseek (*Kew Distrib* 5970)

Caudex prostrate, elongate clothed with fibres, as thick as a swan's quill *Leaves* deep green above, glaucous white beneath *Spadix* $\frac{3}{4}$ in., male infl cylindric

5 **S. colocasioides,** *Hook f*, leaves 19–24 in broadly ovate acute base broadly retuse, spathe 5–9 in narrowly lanceolate acuminate tube convolute limb creamy yellow, fem infl half free Aroid *Wall Cat* 8944, 8947

SIKKIM HIMALAYA, *King* (*Ic in Herb Calcutt*) SILHET, *De Silva* CACHAR, *Keenan* (*Hort Kew*)

Caudex elongate, $1\frac{1}{2}$ in diam, fibrous above *Leaves* thin in texture, light green above, glaucous beneath, petiole 12–18 in, green *Peduncles* several, 6–7 in *Spathe* erect, tube 1 in, ovoid, green; limb membranous *Spadix* 2 in, fem. infl cylindric above the middle, male as long as the fem cylindric *Ovaries* globose; staminodes very minute, clavate?—Very different from its congeners in size and spathe

6 **S. capitellata,** *Hook f*, leaves 8–9 by 7–8 in orbicular ovate subacute base broadly retuse spathe 3½–4 in pendulous from the decurved peduncle lanceolate acuminate yellowish brown without pale purple and striated within, male infl globose

Burma, in evergreen forests Tonkyaghet *Kurz* (*Ic in Herb Calcutt*)

Caudex as thick as the little finger densely fibrous sheaths 4 in *Leaves* pale green above, paler beneath nerves about 5 pairs strong arched, petiole 1 ft, slender *Peduncles* many (4 in the drawing) 4 5 in, very slender *Spadix* ½–1 in, fem infl very long

15 HAPALINE, *Schott*

Small tuberous herbs *Leaves* membranous cordate or sagittate *Spathe* long peduncled tube cylindric decurrent tightly convolute, limb lanceolate or linear oblong flat *Spadix* equalling the spathe, male and fem. infl remote, male elongate, fem adnate to the spathe, of few uniseriate ovaries *Male fl* an elongate hexagonal peltate shortly stipitate body, with 4–6 minute globose anther cells pendulous from its margin. *Ovaries* ovoid, 1 celled, 1-ovuled, stigma disciform, ovule erect, anatropous

1 **H. Benthamiana,** *Schott in Œstr Bot Wochenbl* (1857) 85, *Prodr* 162, leaves oblong sagittate basal lobes narrow obtuse more than half as long as the anticous, spathe acuminate, *Engler Arac* 489, *Kurz in Journ As Soc Beng* xlii. ii (1873) 109, t 9 Hapale, *Schott Gen Aroid* t 44.—*Aroid Wall Cat* 8953 A

Burma, banks of the Attran river, *Wallich* Pegu and Martaban, in dry forests *Kurz*

Tuber small *Leaves* few, 3–4 in long, a nus deep, narrow, petiole and peduncle slender *Spathe* 2–3 in long, membranous, white

2 **H. Brownii,** *Hook f*, leaves ovate acuminate deeply cordate, basal lobes rounded ⅓rd the length of the anticous, spathe oblong apiculate

Malay Peninsula Quedah alt 100 500 ft *King's Collector*

Habit of *H Benthamiana* differing in the basal lobes of the leaf and form of the spathe —Named after Mr N E Brown, assistant in the Kew Herbarium (see p 499)

16 REMUSATIA, *Schott*

Tuberous *herbs*, flowering and leafing in alternate years? bearing [illegible] peltate. Spathe [illegible]

[illegible]

anther cells opening by terminal slits *Ovaries* ovoid, 1 celled, stigma sessile, disciform, placentas parietal, ovules many, orthotropous *Berries* small. *Seeds* albuminous, embryo axile

1 **R. vivipara,** *Schott Melet* i 18, *Syn* 43, *Gen Aroid* t 36, *Prodr* t 137, in *Ann Gand* (1846), t 66, bulbilliferous shoots very stout suberect or ascending simple or very shortly branched, limb of spathe

covered with flat neuters, appendage slender, narrowed to the tip, golden yellow — In a fine drawing of this species in Herb Calcutt the stigma is represented as disciform

3 **C. fallax,** *Schott in Bonpland* (1859), 28, *Prodr* 138, leaves orbicular ovate base cordate or emarginate, nerves strong, tube of spathe 4–6 times shorter than the lanceolate limb, fruiting subspherical, style short, stigma disciform C Wendlandii, *Engl Ic ined* No 240 — Aroid *Wall Cat* n 8952 A

SIKKIM HIMALAYA, alt 1–3000 ft, *Clarke* KHASIA HILLS alt 1–4000 ft *J D H* and *T T*

Tuber small *Leaves* 4–6 by 3–5 in, largest 8 by 7 in, much thicker in texture and with much stronger nerves than *C affinis* *Spathe* and *spadix* much as in *affinis* but usually with fewer neuters between the male and fem infl *Anthers* stellately crenate in both

4 **C. virosa,** *Kunth Enum* iii 39 (*in part*), leaves large ovate sub

BENGAL and the lower Provinces of India *Roxburgh*

Stem short simple, cylindric *Leaves* 1 2 ft by 6–15 in, petiole about as long, terete smooth green *Peduncles* clustered *Spathe* nearly straight, subulate convolute *Spadix* 3 in, obtuse lower third female *Anthers* peltate, 8–12-celled, ovaries broadly ovoid 1-celled, stigma large subsessile peltate, placentas 3–4 — Descript from Roxburgh, nothing further being known of this plant

5 **C. Mannii,** *Hook f*, leaves oblong ovate base sagittate lobes very obtuse sinus broad acute, spathe narrowly oblong cymbiform, spadix half as long as the spathe sub acute, appendage 0

UPPER ASSAM, at Makum *Mann*

Leaves 8–12 by 4–7 in, nerves 6–7 pairs not stout, basal lobes 4 in, petiole 1–3 ft *Peduncle* rather slender *Spathe* 6–7 in, tube 1 in *Spadix* 1½–4 in, male infl 1 in intermediate space ½ in, male 1¼–1½, tip rounded *Anthers* stellately crenate *Ovaries* globose, stigma a discoid area

6 **C. gigantea,** *Hook f* petiole pruinose, leaves very large ovate cordate, spathe 6 in, limb oblong or elliptic oblong cymbiform cuspidate, appendage very short acute C indica, *Engler Arac* 491 (*not Kunth*) Leucocasia gigantea *Schott in Œstr Bot Wochenbl* (1857), 34, *Prodr* 141 (*excl syn* pruinipes)

PERAK *Scortechini* — DISTRIB Cochinchina, Java

Leaves 18–20 by 14–18 in, base deeply cordate, margin repand, nerves 8–10 pairs, very stout, lobes 6–8 in, rounded, sinus open, petiole 2–3 ft. *Peduncle* very stout, tall *Spathe* 5–6 in coriaceous; tube 2¼ in, glaucous, limb erect *Spadix* yellow, fem infl 1¼ in conic, neuter infl 1 in slender, male stout, cylindric, terminating in a rudimentary conic appendage *Ovaries* very numerous narrow, stigma very broad, covering the whole ovary, ovules parietal, scattered — The ovaries are quite unlike those of its congeners

19 ALOCASIA, *Schott*

Characters of *Colocasia*, but ovules few, basilar, erect — Species perhaps 20 or 30, tropical Asiatic

* *Leaves not or slightly peltate, lower nerves approximate and flabellately spreading*

1 **A. cucullata,** *Schott Melet* 18, *in Œstr Bot Wochenbl* (1854), 410, *Syn* 48, *Prodr* 156, leaves subpeltate broadly ovate cordate nerves [illegible] *Ic* 498
[illegible] ıleata,
[illegible] *im* iii
[illegible] *Thw*
[illegible] latum,

BENGAL, *Roxburgh* (cultivated *Clarke*) The KHASIA HILLS, alt 4000 ft *J D H* and *T T* PEGU, *Kurz* CEYLON (native?) *Thwaites*

Rootstock 1–2 ft, with many suckers branched inclined *Leaves* 6–12 by 4 7 in, ½-circular, nerves very stout petiole 1–3 ft green *Spathe* 6–12 in fleshy, tube 2–4 in, limb narrowly cymbiform, margins convolute *Spadix* shorter than the spathe, appendage short

2 **A. montana,** *Schott in Œstr Bot Wochenbl* (1854), 140, *Syn* 47, *Prodr* 151, leaves broadly ovate cordate repand nerves 5–6 pairs, petiole short stout, peduncles many connate below *Miq Fl Ind Bat* iii. 209, *Engler Arac* 499 Colocasia? montana, *Kunth Enum* iii 40 Arum montanum, *Roxb Fl Ind* iii. 497, *Wight Ic* t 796

NORTHERN CIRCARS *Roxburgh* —DISTRIB Java

Rootstock subcylindric, as thick as the wrist with long suckers from the crown *Leaves* 6–8 in shining, petiole 8–10 in, sheathing half way up *Spathe* 4–6 in, coloured, limb thrice as long as the tube *Spadix* nearly as long as the spathe, appendage 2½ in *Stigma* 3–4 lobed —I have seen no specimen

3 **A. rapiformis,** *Schott Prodr* 157, *Engler Arac* 510 Colocasia rapiformis, *Kunth Enum* iii 40

PEGU *Carey*

Differs, according to Roxburgh from *A montana* in having a tuberous turnip-shaped root —I have seen no specimen

** *Leaves not or hardly peltate, nerves pinnate*

4 **A. indica,** *Schott in Œstr Bot Wochenbl* (1854), 410, *Syn* 46, *Prodr* 141, leaves large ovate deeply sagittately cordate repand, lobes rounded sinus narrow, tube of spathe many times shorter than the very long linear oblong subtruncate cuspidate limb stigma sessile 3–4 cleft *Miquel Fl Ind Bat* iii 206, *Engler Arac* 501 Colocasia indica, *Kunth Enum* iii 39 Arum indicum, *Roxb Fl Ind* iii 498, *Wight Ic* t 794— Aroid *Wall Cat* 8918

[illegible]

5 **A.** [illegible]
shortly ac [illegible]
long as th [illegible]
slender

the anticous, tube of spathe as long as the cymbiform limb, appendage as long as the infl A perakensis, *Hemsl. in Journ. Bot* xvii (1887), 205

PERAK; *Wray, Scortechini*
Stem subscandent, rooting, as thu
or fleshy, nerves 3-4 pairs, s ender,
in, slender, sheath very short *Ped*
white or green, tube oblong; app
obovoid, style long, stigma disciform

DOUBTFUL AND EXCLUDED SPECIES

A ALBA, *Schott in Œstr Bot Zeitschr* (1852), 59, *Syn* 48; *Prodr* 149; is a Javan species, attributed to Ceylon on the faith of a specimen from Herb.

ight Ic t 789 (*not of Fl Ind & Wight Ic*

Leaves ovate cordate, acuminate, 6-7 by 5 in, basal lobes connate for $\frac{1}{10}$ of their length, sinus very acute, nerves 5-6 pairs, petiole 8-12 in, sheathing half way up *Peduncles* binate, 6 in *Spathe* 4 in, tube 1 in, ellipsoid, green, limb 1½ in broad, obovate, cuspidate, open, yellow *Spadix* as long as the spathe, pale yellow, appendage stout, conical, acuminate, as long as the infl *Ovary* ovoid, narrowed into a style with a 3 fid stigma *Seed* broadly ovoid —I cannot identify this with any Indian species; it is probably one of Roxburgh's plants collected near Samulcottah in the Northern Circars

ALOCASIA, sp. Malacca, *Griffith* (*Kew Distrib* 6303, 6009), and A sp, Malacca, *Maingay* (*Kew Distrib* 1549, 1549²) may both be new, but are not in a good state, and may be referable to Malayan species unknown to me

20 AGLAONEMA, *Schott*

Herbs, caudex erect or prostrate *Leaves* ovate or oblong *Spathe* b cymbiform gaping or base shortly athe, or shorter, stipitate; male and

age U *Stamens*
apical pores *Ovar*
or cupular, ovules
capitate *Seeds* exalbuminous, embryo macropodal —Species about 20, Tropical Asiatic and African

* Nerves of leaf numerous, close, parallel, all uniform, very slender. (See also 10 *A. pumilum*)

1 **A Griffithii,** *Schott Syn* 123, leaves 12-16 by 3-4 in linear stre, *Teysm and Kurz in Journ* thu, *Schott Gen.*

MALACCA, *Griffith* (*Kew Distrib* 5991) —DISTRIB Sumatra.
Leaves coriaceous, petiole very stout. *Peduncle* 12-18 in, very stout. *Spathe* 2 in, oblong, cuspidate *Ovaries* 2 celled

2 **A oblongifolium,** *Schott in Wien Zeitschr* iii (1829), 892 (*ex Linnæa* vi (1831), *Litterb* 53), leaves 8-24 by 2-4 in linear-oblong acu-

ar the top, spathe 2-4 in. ...grifolium, *Schott Melet* ... *Prodr* 302, *Engl Arac* ..., *Wight Ic* t 806 C... tegrifolium, *Link Enum*

PENANG, PERAK, and SINGAPORE, *Wallich*, &c —DISTRIB Borneo

Caudex 1-3 ft *Leaves* coriaceous dark green, shining *Peduncles* 4-8 in *Spathe* green, margins white *Spadix* stout nearly as long as the spathe, male infl subacute *Ovary* 1-celled, stigma tabular, much broader than the ovary (ex *Ic Scortechini*)

3 **A. Helferi,** *Hook f*, leaves 6-10 by 2-2¼ in oblong lanceolate caudate acuminate base acute, petiole 5-6 in sheathing for the lower third, peduncles 2-3 in, spathe 1 in oblong lanceolate acute

TENASSERIM, *Helfer* (*Kew Distrib* 5994)

Caudex 6 in and upwards branched, as thick as a swan's quill, leafy upwards *Leaves* thin, costa not very stout nerves very slender *Spadix* with the stipes nearly equal the infl *Ovary* 1 ovuled, stigma disciform

4 **A. Clarkei,** *Hook f*, scandent, leaves 7-9 by 2-3 in elliptic-lanceolate caudate acuminate base acute, petiole 8-9 in slender sheathing at the base only, peduncle 5-6 in, seeds ¾-1 in, fusiform

CHITTAGONG, at Kasalong, *Clarke*

Near *Helferi*, but the petioles are much longer and more slender, the leaves of a firmer texture with stronger costa and nerves

** Primary nerves much stronger than the intermediate or secondary

† *Leaves* 8-12 *in*

5 **A. Hookerianum,** *Schott in Bonpland* vii (1859) 30, *Prodr* 301, leaves 8-11 by 3½-4½ in elliptic ovate or oblong acuminate, base rounded or cuneate and unequal sided, primary nerves 6-8 pairs arching, petiole 6-8 in stout sheathing to about the middle or beyond it, spathe 1½-2 in oblong cuspidate *Engler Arac* 438, *N E Br in Gard Chron* (1882) iii 333

KHASIA HILLS, alt 2-3000 ft, *Griffith*, &c CACHAR, *Keenan* CHITTAGONG, at Seetakoond, *H f & T*, *Lister* ARRAKAN, *Kurz*

Caudex elongate, ½ in thick, nodose *Leaves* thinly coriaceous, dark green above, nerves very slender *Spathe* cymbiform, dark green *Spadix* long stipitate *Ovaries* few, flagon shaped, narrowed into a conical style *Seeds* ½-1 in long, cylindric

6 **A. birmanicum,** *Hook f*, leaves 8-10 by 2½-3½ in elliptic-oblong or lanceolate caudate acuminate, base rounded, primary nerves about 10 pairs erecto patent slightly curved, petiole 2-3 in sheathing to about the middle, peduncle very short, spathe 1½ in. linear-oblong caudate acuminate

... ...e top only, ...the ... *Peduncle* ¼-1 ... narrow cau-date spathe are quite unlike any allied species

7 **A. Schottianum,** *Miq Fl Ind Bat* iii. 316, in *Bot Zeit* (1856),

565, leaves 8–12 by 1½–4½ in oblong acuminate or subcaudate, base acute rounded or cordate sometimes unequal-sided, primary nerves 9–12 pairs petiole sheathing to ⅓–½ its length, peduncles short, spathe 1½ in oblong cuspidate *Schott Prodr* 303, *Engler Arac* 440 A longecuspidatum *Schott l c* 304 A malaccense, *Schott in Bonpland* (1859) 30, *Prodr* 302—Aroid *Wall Cat* 8961

BURMA, from Pegu to Tenasserim *Wallich*, &c PERAK, *Scortechini*. MA-

bcoriaceous
late, lower
Seeds ½ in

8 **H. nicobaricum**, *Hook f*, leaves ovate or oblong shortly acuminate, base rounded equal or somewhat unequal sided, principal nerves 7–9 pairs, petiole short sheathed to the middle, peduncles equalling or shorter than the petiole spathe 1½ in oblong acuminate

NICOBAR ISLANDS *Kurz*, *King s Collector*
Stem probably as thick as the little finger *Leaves* 8–10 by 3–4½ in, secondary nerves indistinct petioles 3 5 in, rather slender —The broad thin leaves with short points are very different from *birmanicum* and *malaccense*

†† *Leaves 3–4 in long, petiole sheathing at the base only*

9 **A. Scortechinii**, *Hook f*, leaves ovate to elliptic oblong acuminate, primary nerves 6–7 pairs arched strong beneath secondary few obscure, petiole ½–1 in sheathing at the base only, spathe terminal peduncle ½–2 in.

PERAK, *Scortechini*
Stem erect 6–12 in as thick as a swan s quill *Leaves* membranous, rather waved, "pustular beneath' *Scort*) *Seed* ellipsoid, obtuse, ¼ by ⅙ in

10 **A. pumilum**, *Hook f* leaves 3–4½ in ovate or ovate lanceolate acuminate, base rounded primary nerves very faint arched petiole shorter than the limb, spathe ¾ in oblong apiculate peduncle slender nearly as long as the petiole Aroid *Wall Cat* 8960 B

BURMA, Chappedong Hill *Wallich*, Mergui, *Griffith*
Caudex probably as thick as a goose-quill, rooting *Leaves* thinly coriaceous, primary nerves sometimes undistinguishable from the secondary *Seed* ⅓ in long, ellipsoid

11 **A. minus**, *Hook f*, leaves 3–4 oblong or ovate oblong acuminate, base rounded, primary nerves 3–4 pairs faint arched petiole shorter than the limb peduncle very short A pictum, *Engler Arac in part* (*not of Kunth*) —Aroid *Wall Cat* 8960 A

SINGAPORE, *Wallich*
Caudex erect, 6–7 in, as thick as a swan's quill *Leaves* thinly coriaceous, brown when dry primary nerves sometimes undistinguishable from the secondary, petiole slender *Peduncle* ½ ¾ in

12 **A. nanum**, *Hook f*, leaves 4–5 in ovate or oblong lanceolate acuminate coriaceous base subacute unequal sided, primary nerves 5–6 pairs arched, sunk above prominent beneath, petiole shorter than the blade, peduncles 1–1½ in, spathe ¾ in oblong beaked

PERAK; in dense Bamboo forests alt 4–600 ft, *King's Collector*
Stem as in *A minus*, but leaves much more coriaceous, with strong nerves,

secondary very indistinct *Petiole* not half the length of the blade, slender *Spathe* yellow-green *Seed* ½ in long, linear oblong

13 **A. costatum,** *N E Br in Gard Chron* 1892, i 426, leaves
e base retuse or sub
rongly arched petiole
1 in obovoid, spadix

PERAK, *Curtis* (*Hort Veitch*)

Leaves 2½-3 in broad dark green costa stout, base rather unequal sided, petiole ⅛ in. diam, terete sheath basal *Spathe* light green subacute *Spadix* very large, the protruding male part ¾ in long, ⅓ in diam

21 HOMALOMENA, *Schott*

Herbs rhizome stout or 0 *Leaves* entire very variable in shape *Spathe* usually erect, convolute, wholly persistent round the fruit *Spadix* included, male and fem infl close together, cylindric ovaries with or

about 30 tropical

Chamæcladon as constituted by Schott, cannot (as Mr N E Brown had ... s, or by any h would be th no such ther group- tho best I *H rostrata* differs from the generic character in having a vacant space in the spadix between the male and fem infl

* Spathe contracted above the female infl

1 **H. sagittæfolia,** *Jungh ex Schott Prodr* 311, leaves ovately or deltoidly sagittate acuminate not much longer than broad, basal lobes usually spreading, sinus rounded at the base spathes many 3-4 in long, tube much shorter than the limb *Miq Fl Ind Bat* iii 212, *Engler Arac* 334 ? H propinqua, *Schott in Ann Mus Lugd Bat* i 280, *Engler l c* 33

PERAK, *Scortechini Wray*, alt 2500 3 00 ft, *King's Collector* —DISTRIB Borneo

Robust (stemless, *Scortech*) *Leaves* 8 14 by 6-10 in, firm, lobes rarely conniving sinus broad or narrow nerves rather strong, petiole 1-1½ ft, sheathing to the middle *Peduncle* 6-9 in *Tube of spathe* 1-1¼ in limb 2-3 in by 1 broad, white, pink when young *Spadix* stipitate *Male infl* 3 in by ½ in diam, fem 1 in *Stamens* in groups of 5-6 *Ovary* oblong, 3 celled, stigma pulvinate — *Descript chiefly from notes by Scortechini*

2 **H. paludosa,** *Hook f*, leaves oblong hastate usually twice as long as broad acuminate, basal lobes divaricate obtuse or rounded, sinus broad rather deep base rounded, spathes numerous 3-4 in, tube as long as the limb

PERAK, *Larut*, in very wet jungly places, *King's Collector*, *Scortechini*

Leaves 7–10 by 2½–4 in, primary nerves slender, petiole 8–12 in sheathing to the middle *Peduncles* 2–7, 6–7 in when flowering, elongating to 12 in *Spathe* white, striped with pale green *Spadix* stout, stipitate, male infl rather slender, about equalling the fem *Ovary* 3-celled, stigma pulvinate, obscurely 3 lobed

3 **H. rostrata**, *Griff Notul* iii 154 (*err typ roshalum*), limb of leaves 12–20 by 3–6 in oblong lanceolate acuminate, petiole as long sheathing to beyond the middle, spathes many 4–6 in *Schott Syn* 119, *Prodr* 312 Chamæcladon sanguinolentum, *Griff l c* 147, *Schott Prodr* 316

MALACCA *Griffith* (*Kew Distrib* 5989, 5990)

Hab t of *Calla* ... , undulate, ... blood red, ... hite, tube ... infl about ... s capitate

** Spathe not contracted above the fem infl

† Leaves 6–12 in broad, deeply cordate sagittate or hastate Spathe 2–4 in long

4 **H. rubescens**, *Kunth Enum* iii 57, leaves cordate or sagittately cordate acuminate, basal lobes semi ovate or rounded approximate much shorter than the anticous, sinus narrow, spathes red *Schott Syn* 118, *Prodr* 310, *Engl Arac* 336 (excl *singaporensis*) H rubra *Hassk ex Regel Gartenfl* (1869) t 634 Zantedeschia rubens, *C Koch Ind Sem Hort Berol* 1854, *app* Calla rubescens, *Roxb Fl Ind* iii 515, *Wight Ic* t 807

SIKKIM HIMALAYA and KHASIA HILLS, *J D H* CHITTAGONG, *Buchanan* — DISTRIB Java

Caudex short rooting 1 in diam *Leaves* 6–12 in, usually tinged with red, sinus subacute or rounded at the red petiole which is longer than the leaf and sheathing for ½ its length *Peduncles* several, 3–4 in stout *Spathe* 3 in, oblong, acute at base and top — I am very doubtful as to the limits and habitats of this species, it being impossible to distinguish some forms of *cœrulescens* from it Roxburgh perhaps by error, describes the petioles as 1–5 ft long He figures the sinus as more acute than in any of the specimens I refer to the species

5 **H.** ...

t 12

ASSAM, *Masters* *Griffith* (*Kew Distrib* 5966 5967) CHITTAGONG *Roxburgh*

This is no doubt a different plant from *H rubescens* as ... slow; but except the green ... find no diagnostic characters, ... burgh's character of basal lobes ... leaves in his drawing which ... with *H rubescens*

6 **H. cœrulescens,** *Jungh ex Schott Prodr* 310, leaves deltoidly ovate acute or acuminate, base subhastate or cordate with a broad shallow sinus, rarely sagittately cordate lobes rounded at the tip spathe 2½-3½ in subacute pale yellow white within *Miq Fl Ind Bat* iii 212, *Engler Arac* 339 *Ic ined* No 67 H minus and majus *Griff Notul* iii 152, 153 *Schott Syn* 119 *Prodr* 312 *Engler l c* 343 H Wallichii, *Schott in Bonp and* (1859), 30 *Prodr* 311 *Engler l c* 335 Caladium amboinense, *Herb Ham* — Aroid *Wall Cat* 8901

PENANG, *Wallich* PERAK *Scortechini* MALACCA, *Griffith* (*Kew Distrib* 5965 6011) *Maingay* (*Kew Distrib* 1542) — DISTRIB Java

Rootstock short as thick as the thumb or thicker *Leaves* 5-12 in, and often

f

wanted to distinguish this *aromatica* and *rubescens*

7 **H. pontederæfolia,** *Griff mss*, leaves 4-8 in coriaceous hastately deltoid acuminate base truncate or subcordate, principal nerves strong, peduncles short stout, spathe 1½-2¼ in obtuse

MALACCA, at Ayer Punus, in heavy forest, *Griffith* (*Kew Dist*, 5964) PERAK, *Scortechini Hervey*

Stem short *Leaves* nearly black when dry, principal nerves 6-7 pairs, intermediate very obscure, petiole 6-15 in sheathing for ⅓ of its length *Peduncles* several 2-4 in decurved after flowering — In a sketch by Scortechini the spathe is represented as inflated and spadix shortly exserted

†† Leaves rarely 6 in broad base acute or rounded rarely truncate

§ *Limb of leaves usually as long as the petiole or longer, rarely shorter Spadix sessile in all but H Griffithii*

8 **H. angustifolia,** *Hook f*, leaves 5-6 by ⅓-¾ in narrowly linear lanceolate acuminate at both ends coriaceous, nerves few straight nearly ?-¾ in oblong apiculate *Bonpland* (1858) 369, 3 Calla angustifolia, 59 (*in part*)

PENANG, *Wallich*

Rootstock as thick as a goose quill, prostrate *Leaves* with a thickened mucro, petiole 4-5 in rather slender, sheathing from ½ or ⅓ their length *Peduncles* ½-1 in *Spathe* thin. *Spadix* with the fem infl ¼ the length of the male

9 **H. lancifolia,** *Hook f*, leaves 6-9 by 1½-2½ in narrowly elliptic lanceolate gradually acuminate at both ends, nerves many pairs erecto-patent, peduncles short, spathe ¾ in, linear oblong cuspidately acuminate

PERAK, *Scortechini*

Rootstock suberect, rooting *Leaves* rather coriaceous, nerves raised above, petiole 6-10 in, sheathing ⅓-½ its length *Peduncles* 1½-2 in slender *Spathe* membranous, striate *Spadix* with the fem infl nearly half as long as the male — Near *Cham. consobrina*, Schott, of Sumatra, but a much stouter plant

10 **H. humilis,** *Hook* f., leaves 4-6 by 1½-2 in elliptic-oblong acute

or acuminate, base rounded or cuneate, nerves 5-8 pairs erecto patent

PENANG, *Wallich, Porter* PERAK, *Scortechini* —DISTRIB Borneo

Rootstock 2-3 in, as thick as a swan's quill *Leaves* rather thin, margins often minutely crisped when dry, petiole 5-6 in, costa and nerves beneath slender *Peduncles* ½-1 in *Spathe* rather membranous, not striate *Spadix* sessile, ¾ in long, obtuse, fem infl about ¼ in with or without staminodes —Engler figures the nerves as very numerous, but describes them corectly as 5 8 pairs

11 **H. velutina,** *Scortechini mss*, leaves 2½-5 by 1¼-2½ in broadly oblong or obovate oblong acute, base rounded cuneate or cordate at the petiole, nerves 10-15 pairs strong beneath, petiole sheathing ¾ to ⅓ of its length, peduncles many very short, spathes ½-⅔ in narrow with a recurved cusp, spadix sessile, fem infl ⅓-½ the length of the male

PERAK, *Scortechini*, at Sunga Ryah, *King's Collector*

Rootstock as thick as the little finger, copiously rooting *Leaves* rather

more numerous nerves of the leaf

12 **H. Griffithii,** *Hook f*, leaves 4-7 by 1¼-2½ in more or less obliquely elliptic oblong or oblong lanceolate tip curved subcaudate acuminate base rounded or cuneate nerves 4-5 pairs erecto patent slightly arched, petiole slender sheathing ¾ the way up, peduncles many very short, spathe ¾-1¼ in ovoid acuminate or rostrate, spadix stipitate Chamæcladon Griffithii, *Schott in Bonpland* (1858), 369, *Prodr* 315, *Engler Arac* 316, *Ic ined* n 113

MALACCA, at Ayer Punus, *Griffith* —DISTRIB Borneo

Rhizome as thick as the little finger, copiously rooting *Leaves* rather thin, base usually unequal sided costa and nerves slender tip mucronate red brown, petiole 4-6 in *Peduncle* 1-2 in *Spathe* green *Male infl* rather longer than the fem acuminate; fem with many capitate staminodes amongst the ovaries

13 **H. Scortechinii,**

spadix sessile

PERAK, *Scortechini*; on Mt Bubong in bamboo forests, *King's Collector*

Rootstock as thick as a swan's quill rooting *Leaves* rather thin, tip curved, base rarely unequal-sided; petiole 2-6 in *Peduncle* rather slender *Spathe* light green with a darker green center (King's Coll); dark green "with (velvety gloss above" *Scortechini*) *Spadix* sessile, fem infl shorter than the slender male *Ovaries* globose, stigma disciform —Near *H Griffithii*, but the leaves are narrower at the base, the peduncles much longer, the spathes larger, obtuse with a recurved beak, and the spadix is sessile

14 **H. obliquata,** *Hook f*, leaves 4-6 by 1¼-3 in lanceolate or

ovate lanceolate caudate acuminate base obliquely acute rounded subtrun- [illegible] way up, [illegible] ed, spadix [illegible] amaciadon [illegible] *gler Arac*

347, *Wall. Cat* n 8963

PENANG, *Phillips*, *Wallich*, MALACCA, *Maingay*

Rootstock as thick as the thumb *Leaves* very variable, usually broadest at the base with unequal rounded sides, nerves slender, nearly straight, except the basal where the base of the leaf is broad tip with a thick long mucro *Peduncles* ½–2 in. *Stigma* disciform *Seeds* many, faintly sulcate, red brown —Closely resembles *H. Griffithii*, but the spadix of that plant is stipitate

15 **H. Kingii**, *Hook f*, leaves 4–5 by 2–2½ in oblong or ovate-oblong acute and mucronate, base rounded or subcuneate, nerves 4–5 pairs, petiole stout sheathing from ⅓–¼ way up, peduncles short, spathes ¾–1 in oblong cuspidately beaked, fem infl nearly as long as the male

SINGAPORE, in swamps, *King*

Rootstock as thick as the little finger *Leaves* thinly coriaceous, slightly unequal-sided, nerves erecto-patent, slightly arched, tip with a thick mucro, petiole rather stout *Peduncle* 1½–1¾ *Berries* about 15 seeded *Seeds* red-brown

16 **H. truncata**, *Hook f*, leaves 3–4 by 1–1½ in oblong or triangular or oblong lanceolate acuminate from a broad truncate or sub- [illegible]

MERGUI, *Griffith* —DISTRIB Borneo?

Rootstock as thick as a goose-quill *Leaves* very membranous; nerves many, nearly straight, except the basal base usually unequal-sided, tip mucronulate *Spathes* slightly curved narrowly oblong in flower, broader in fruit *Spadix* narrowed and few fld at the base but hardly stipitate *Stigma* capitate *Seeds* very many, striate —The Bornean specimen included by Schott has identical leaves, but a larger narrower falcate finely acuminate spathe, a distinctly stipitate spadix, no (or obscure) staminodes, and furrowed seeds

17 **H. pumila**, *Hook f*, leaves 1½–2 in elliptic-ovate obovate or oblong subacute apiculate membranous nerves very faint petiole very slender sheathing at the base, peduncles short slender, spathe ½–¾ in linear oblong cuspidately beaked, spadix sessile, fem infl ¼ the length of the acute male, staminodes few

SINGAPORE, *Maingay* [illegible]

18 **H.** [illegible], *Hook f*, leaves 4½–5 by 2–2½ in [illegible]

PERAK, at Larut, alt 100–1000 ft, *King s Collector*
Rhizome as thick as the little finger, elongate, rooting *Leaves* serrate on the

§§ *Petiole longer than the leaf blade* *Spadix stipitate in all*

19 **H. elliptica,** *Hook f* leaves 3–4 by 1¾–2 in subfalcate elliptic-ovate acute or acuminate hardly mucronate many nerved base cuneate, petiole slender sheathing for ⅓ to ½ its length, peduncles elongate spathe ¾–1 in linear oblong cuspidately beaked, spadix shortly stipitate, fem infl not ½ the length of the male with intermixed staminodes

iequal
irched

20 **H. ovata,** *Hook f*, leaves 6–7 by 3–4 in ovate acuminate base rounded few nerved, petiole rather longer than the blade sheathing less than half way up peduncle 2–3 in, spathe 1½ in linear-oblong acute, spadix stipitate, fem infl half the length of the male staminodes 0
Chamæcladon ovatum *Schott in Bonpland* (1859) 30, *Prodr* 315, *Engler Arac* 348 —Aroid *Wall Cat* n 8964

SINGAPORE, *Wallich* PENANG, *Herb Delessert*
Roots ock as thick as the middle finger *Leaves* rather coriaceous base unequal or not, nerves 5–6 pairs slightly arched, rather strong beneath, secondary obscure, petiole not very stout *Spathe* 1–1½ in straight *Spadix* as long as the spathe, fem infl not half as long as the elongate conoidal acute male, ovaries subglobose, stigma subcupular obscurely lobed

21 **H. trapezifolia,** *Hook f* leaves 4–5 by 2½–4 in trapezoidly or
truncate
ng ¼–½ of
cuminate,

Stam nodes 0 or few at a private *Stigma* a scutiform

22 **H. deltoidea;** leaves 6 by 4 in deltoidly ovate or subhastate acuminate basal angles or lobes rounded sinus very broad rounded not cuneate at the insertion of the petiole peduncles short, spathe 2 in narrowly ellipsoid narrowed into a long slender cusp

PERAK *Scortechini*
Rootstock as thick as
H trapezifolia, but not
with innumerable slender
length *Peduncles* sever
longer than in *H trapezifolia*, and spadix stouter *Stigma* discoid —I have seen only one specimen

DOUBTFUL SPECIES

H SINGAPORENSIS *Regel Ind Sem Hort Petrop* (18?9) 18 *in Gartenfl* (18?0 53 l aves 7 9 by 6–8 n al nost ex ctly deltoid acum nate b e trunc te basal angles rounded petiole clouded sheathing half ay up red at the base spathes green without white within —S ngapore

22 SCHISMATOGLOTTIS, *Zoll & Morrit*

Stoloniferous herbs stem short *Leaves* entire intramarginal nerve strong *Spathe* cylindric convolute hardly constricted limb deciduous *Spadix* sessile included in the spathe appendage 0 with barren organs in the middle or top *Inflorescences* contiguous or nearly so male cylindric or clavate stamens - d stinct filament flat anthers trun cate pr smatic or compressed cells with large pores connective warted at the tip pollen ve staminodes few, clavate or 0 *O* vules many anatropous parietal the spathe many seeded *Seeds*

* Tube of spathe after flowering subcylindric

† *Leaves rounded or if cordate not deeply lobed at the base*

1 **T. Wallichii,** *Hook f* limb of leaf 5–9 in shorter or longer than the pet ole lanceolate or nerves 8–10 pairs or more petiole long peduncled narrowly linear obl in the middle and male at the top —

PERAK *Scortechini King s Collector* SINGAPORE *Wallich* MALACCA *Maingay*

Leaves 1½ 2½ in broad rather membranous w th slender reticulate secondary nerves betwee the pr mary base rounded or s ibcordate pet ole 8–12 in *Peduncle* 3–4 in *Spathe* 3 3½ in nearly stra gl t acum nate wh te *Spadix* rather slender fem i fl as long as the neuter male shorter clavate ovaries globose st gma d sc form

VAR *oblongata* leaf 8 10 by 3½ 4 in more coriaceous cuspidately caudate base rounded costa very stout nerves obscure Per k in marshy places *Scortechini King s Collector* Perhaps a d fferent species

2 **S. brevicuspis,** *Hook f* limb of leaf equalling or exceeding the petiole 4–6 by 1½–3 i y short subu late cusp nerves m few petiole sheathing for half i 3 in long acuminate spadix i nfl elongate followed by a short s conical tip sterile

PERAK *Scortechini*

Rootstock as th ck as a goose qu ll elongate trail ng *Leaves* membranous, deep gree i above the intermed ite nerves form ng areolæ between the primary *Peduncle* 1–3 in *Spathe* green sh *Ovaries* oblong 2 3 lobed, st gma sub essile, disc form

3 **S Scortechini,** *Hook f* , limb of leaf about equalling the petiole

§§ *Petiole longer than the leaf blade Spadix stipitate in all*

19 **H. elliptica,** *Hook f*, leaves 3–4 by 1½–2 in subfalcate elliptic-ovate acute or acuminate hardly mucronate many nerved base cuneate, petiole slender sheathing for ⅓ to ½ its length, peduncles elongate, spathe ¾–1 in linear oblong cuspidately beaked, spadix shortly stipitate, fem infl not ½ the length of the male with intermixed staminodes

Leaves more or less unequal ... impressed above, slightly arched

20 **H. ovata,** *Hook f*, leaves 6–7 by 3–4 in ovate acuminate base rounded few nerved, petiole rather longer than the blade sheathing less *than half way up, peduncle 2–3 in, spathe 1½ in linear oblong acute,* spadix stipitate, fem infl half the length of the male staminodes 0 Chamæcladon ovatum, *Schott in Bonpland* (1859) 30, *Prodr* 315, *Engler Arac* 318 —Aroid *Wall Cat* n 8964

SINGAPORE, *Wallich* PENANG, *Herb Delessert*

Rootstock as thick as the middle finger *Leaves* rather coriaceous base unequal or not, nerves 5–6 pairs slightly arched, rather strong beneath, secondary obscure, petiole not very stout *Spathe* 1–1½ in straight *Spadix* as long as the spathe, fem infl not half as long as the elongate conoidal acute male, ovaries subglobose, stigma subcupular obscurely lobed

21 **H. trapezifolia,** *Hook f*, leaves 4–5 by 2½–4 in trapezoidly or deltoidly ovate caudate acuminate many nerved base cuneate or truncate and cuneate at the insertion of the long petiole which is sheathing ¼–⅓ of its length, peduncle elongate spathe 1 in narrowly oblong acuminate, spadix stipitate, fem infl hardly half as long as the narrow male

PERAK *Scortechini King's Collector*

22 **H. deltoidea;** leaves 6 by 4 in deltoidly ovate or subhastate acuminate basal angles or lobes rounded sinus very broad rounded not cuneate at the insertion of the petiole peduncles short, spathe 2 in narrowly ellipsoid narrowed into a long slender cusp

PERAK *Scortechini*

Rootstock as thick as ...

DOUBTFUL SPECIES

H SINGAPORENSIS, *Regel Ind Sem Hort Petrop* (18?9) 18, in *Gartenfl* (1870), 53, leaves 7–9 by 6–8 in, almost exactly deltoid acuminate base truncate, basal angles rounded, petiole clouded sheathing half-way up, red at the base, spathes green without white within —Singapore

22 SCHISMATOGLOTTIS, *Zoll & Morritz*

Stoloniferous, herbs, stem short *Leaves* entire, intramarginal nerve strong *Spathe* cylindric, convolute, hardly constricted, limb deciduous *Spadix* sessile, included in the spathe, appendage 0, with barren organs in the middle or top *Inflorescences* contiguous or nearly so, male cylindric or clavate, stamens 2–4, distinct filament flat, anthers truncate, prismatic or compressed, cells with large pores, connective warted at the tip, pollen ve... staminodes few, clavate, or 0 O... ovules many, anatropous, parietal ... the spathe, many-seeded *Seeds* ...

* Tube of spathe after flowering subcylindric

† *Leaves rounded or if cordate not deeply lobed at the base*

1 **T. Wallichii**, *Hook f*, limb of leaf 5–9 in shorter or longer than the petiole lanceolate ... nerves 8–10 pairs or more, petic... long peduncled narrowly linear ... in the middle and male at the top

PERAK, *Scortechini*, *King's Collector* SINGAPORE, *Wallich* MALACCA, *Maingay*

Leaves 1½–2½ in broad, rather membranous, with slender reticulate secondary nerves between the primary, base rounded or subcordate, petiole 8–12 in *Peduncle* 3–4 in *Spathe* 3 3½ in, nearly straight, acuminate, white *Spadix* rather slender, fem infl as long as the neuter, male shorter clavate, ovaries globose, stigma disciform

VAR *oblongata*, leaf 8–10 by 3½–4 in more coriaceous cuspidately caudate base rounded, costa very stout, nerves obscure —Perak, in marshy places, *Scortechini*, *King's Collector* Perhaps a different species

2 **S. brevicuspis**, *Hook f*, limb of leaf equalling or exceeding the petiole 4–6 by 1½–3 in oblong ovate acuminate with a very short subulate cusp, nerves many spreading arching, intermediates few, petiole sheathing for half its length, peduncles short, spathe 3 in long acuminate, spadix nearly equalling the spathe, fem infl elongate followed by a short neuter portion, male infl elongate its conical tip sterile

PERAK, *Scortechini*

Rootstock as thick as a goose-quill, elongate, trailing *Leaves* membranous, deep green above, the intermediate nerves forming areolæ between the primary *Peduncle* 1–3 in. *Spathe* greenish. *Ovaries* oblong, 2–3 lobed, stigma subsessile, disciform

3 **S. Scortechini**, *Hook f.*, limb of leaf about equalling the petiole

* *Leaves entire*

1 **A. montanum,** *Schott in Bonpland* v (1857), *Prodr* 371, . . . blong lanceolate, petiole slender, . *Ic ined* No 83 Scindapsus mon . *id Bat* 184 Pothos malayanus, *Cat* 4444 Calla montana, *Blume*

TENASSERIM, at Mergui, *Helfer* PENANG *Wallich* PERAK, *Scortechini* *King's Collector* MALACCA, *Griffith, Maingay* —DISTRIB Malay Islands

Stem as thick as a goose quill, terete smooth *Leaves* 6–12 by 2½–4 in, coriaceous, base cuneate rounded or subcordate often unequal sided, nerves very many, spreading, petiole 3–9 in, sheathed to the knee in young leaves to a variable height in older, knee ¼–½ in *Peduncles* 2–4 in slender, rigid *Spathe* 1½–2 in, beak long straight *Spadix* 1–2 in, stipes slender *Perianth* cupular, nearly as high as the ovary *Berries* pisiform

Var *longirostris*, beak of spathe as long as the body —Perak, *Wray* —Borneo

2 **A. marginatum,** *Schott in Œstr Bot Wochenbl* (1857), 117, *Prodr* 390, leaves drying green oblong lanceolate acute or acuminate petiole very broadly sheathing up to the knee *Engler Arac* 96 Pothos marginatus, *Wall Cat* 4443

PENANG, *Porter* PERAK, *Scortechini, King's Collector* —DISTRIB Sumatra

usu
she
1½

3 **A. latifolium,** *Hook f*, leaves drying greenish broadly oblong cuspidately acuminate base acute, petiole rather slender, sheath very narrow

PERAK *Scortechini King's Collector*

Stem as thick as a swan's quill *Leaves* 10–13 by 4½ 5½ in, coriaceous, nerves about 12 pairs strong spreading and arched, petiole 7–10 in, narrowly sheathing for ⅔ its length *Peduncle* 3–5 in *Spathe* 2 3 in, white with a greenish without, beak ¼ ½ the length of the body *Spadix* 1 2 in, shortly stipitate *Perianth* annular

** *Leaves pinnatifid*

4 **A. medium,** [illegible] 1857) 45, *Prodr* 392, Rha . . Scindapsus medius, *Zoll* . *Bat* in 186 Epipremnum . *Wall Cat* 4138

PERAK, *Scortechini, King's Collector* SINGAPORE *Wallich, Maingay* —DISTRIB Malay Islands

Stem 20 ft, less than 1 in diam *Leaves* 6 14 in long and broad or broader than long membranous, deeply pinnatifid or pinnatisect, often perforate towards the costa, lobes 2–4 pairs obliquely truncate upper angle acute, basal lobes dimidiate-ovate, petiole channelled sheathing towards the base *Peduncle* 4–5 in *Spathe* 2–3 in, cymbiform, pale green without, white or cream colrd within

needles in the pericarp, and apparently macropodal embryo, all point to *Anadendrum* There are needles in the tissue of the petioles, which I do not find in any other *Anadendrum*

24 SCINDAPSUS, *Schott*

Climbing shrubs with the characters of *Anadendrum*, but the spadix is sessile there is no cupular perianth and the pericarp of the berries abounds in intercellular needles —Species about 10, tropical Asiatic, Australian and Polynesian

See note under genus *Rhaphidophora*

* *Leaves obliquely ovate elliptic or lanceolate*

1 **S. officinalis,** *Schott Meletem* i 21 *Gen* t 81, *Prodr* 395, branches wrinkled when dry leaves 5–10 by 2½–6 in ovate elliptic ovate or nearly orbicular caudate acuminate base rounded or slightly cordate, primary nerves distinct petiole 3–6 in broadly winged up to the knee, spathe 4–6 in oblong subcylindrical beaked *Kunth Enum* iii 63, *Miq Fl Ind Bat* i 452 *Engler Arac* 254 Pothos officinalis *Roxb Fl Ind* i 431, *Wight Ic* t 778 *Wall Cat* 4436 Calla ovata, *Herb Ham*

TROPICAL HIMALAYA from Sikkim eastwards BENGAL, CHITTAGONG, BURMA and the ANDAMAN ISLDS

Stem as thick as the little finger *Leaves* dark green *Peduncle* solitary, [illegible] thout, [illegible] fru t, [illegible] only [illegible]

2 **S pictus,** *Hassk Cat H rt Bogor* (1844), 58, *Pl Jav Rar* 159, branches angled and muriculate when dry leaves 5–7 by 1½–5 in falcately ovate lanceolate to broadly ovate acute or acuminate, petiole 1–1¼ in winged to the knee spathe 1½–2½ in cymbiform beaked *Miq Fl Ind Bat* iii 183 *Schott Prodr* 393, *Engler Arac* 252 S pothoides, *Schott l c* 394 (*not of Miq*) S argyræa *Engler l c* 255

PERAK *King's Collector* —DISTRIB Java Borneo

Stem 6–8 ft as thick as a goose quill or more 4–6 angled when dry through contraction of the tissues, and pale red brown *Leaves* thickly coriaceous dull green, nerves very close and slender primary and secondary hardly distinct *Peduncles* equalling the petiole, very stout *Spathe* white *Spadix* green —The leaves of young plants are orbicular cordate, green blotched with white

3 **S. Scortechinii,** *Hook f*, branches deeply wrinkled when dry not muriculate leaves 3–6 by 1½–2½ in ovate orbicular or falcately lanceolate, acute or acuminate base rounded or subcordate, primary nerves very obscure petiole 2–5½ in broadly winged, spathe 1½–2½ in ovate acute or acuminate

PERAK, *Scortechini*, alt 3 4000 ft, *King's Collector*, on Maxwell's Hill, *Wray*

Stem scandent, as thick as a swan's quill or less, pale, wrinkled, otherwise quite smooth *Leaves* thickly coriaceous, nerves very many, primary hardly distinguishable from the secondary petiole winged to the knee or ¼ way up *Peduncle* much shorter than the petiole *Spathe* yellowish on both surfaces *Spadix* much shorter *Berries* about ¼ in diam across the crown

very obscure *Spathe* remarkably thick-walled (at least ¼ in thick) *Ovaries* narrow, $\frac{1}{10}$ in across the crown

3 **R. Wrayi,** *Hook f*, leaves 7–12 by 1½–2 in narrowly lanceolate caudate acuminate submembranous, base narrowed acute or rounded, nerves capillary on both surfaces, petiole 2–3 in slender channelled up to the blade, spathe 1½–2½ in peduncled cylindric or ovoid beaked spadix as long as the spathe, stigma raised pulvinate

PERAK ...

face ...
$\frac{1}{10}$ ...
Spa ...
2½ ...

4 **R. Lobbii,** *Schott in Bonpland* v (1857), 45, *Prodr* 379, leaves 3–8 by 1½–3 ...
date thinly ...
usually well ...
channelled u...
beaked, stigma raised *Engler Arac* 241

PERAK *Scortechini, King's Collector* MALACCA, *Griffith, Maingay* SINGAPORE, *Lobb* —DISTRIB Borneo, Java

5 **R. minor,** *Hook f*, leaves 3–5 by 1¼–1½ in elliptic lanceolate acute or acuminate base acute or cuneate, primary nerves many slender erecto patent raised on both surfaces petiole 1–2 in broadly channelled up to the blade spathe peduncled 2–3 in beak long slender, stigma raised pulvinate

bro...
Ped ...
very ...
Berries ½ in diam

6 **R. Schottii,** *Hook f*, leaves 8–14 by 2–4½ in falcately lanceolate or oblong lanceolate or oblanceolate caudate acuminate coriaceous, base acute, nerves very many and slender uniform erecto patent raised on both surfaces, petiole 1½–3 in stout channelled to the middle of the knee, spathe 3 in ovoid acuminate spadix peduncled very stout, stigma raised pulvinate *R* Peepla (*in part*) *Schott in Bonpland* v (1857), 45 *Engler Arac* 242

ASSAM, *Masters* KHASIA HILLS, alt 0–4000 ft *J D H & T T*
Stem as thick as the little finger smooth, terete, purple except the young branches ...
base very ob...
when advan...
—In the dr...
very short ...
it is a depre...

vary greatly in length —Near *R Peepla*, but a very much stouter plant, with larger, longer and narrower leaves

7 **R. Scortechinii,** *Hook f*, leaves 10–12 by 3–4 in ovate lanceolate

PERAK *Scortechini*

Stem creeping or stones, nearly as thick as the little finger *Leaves* sub-coriaceous yellow undulate and opaque when dry —The above is chiefly from Scortechini's drawing and notes attached to his specimens The nerves of the leaves are at least 14–20 pairs, united by oblique nervules Scortechini describes the seeds as winged the lateral wings oblique but he does not figure them so

†† *Petiole more than half the length of the leaf blade*

8 **R. lancifolia,** *Schott in Bonpland* (1857), 45, *Prodr* 380, leaves 6–10 by 1½–3 in falcately-lanceolate or ovate lanceolate acuminate or caudate membranous, base acute or rounded unequal sided, nerves very many raised on both surfaces erecto patent petiole 4–7 in channelled to the knee, spathe peduncled 3–4 in ovate oblong long beaked stigmas raised pulvinate *Engler Arac* 241, *Masters in Gard Chron* (1874), ii 611, fig 124

THE KHASIA HILLS and MUNNIPORE, alt 3–6000 ft, *Griffith Watt*, &c

Stem scandent, rooting, as thick as a goose or swan's quill *Leaves* thinly coriaceous, adult greenish brown when dry not shining above, nerves with anastomosing nervules petiole slender *Peduncle* 1 4 in *Spathe* thickly coriaceous, pale or darker red within *Spadix* 1½ 2 in (fruiting 3–4 in), ovaries ⅙ in diam —The 3–5 erecto-patent primary nerves described by Schott are with difficulty distinguished from the secondary and in very few leaves only

9 **R. Peepla,** *Schott in Bonpland* v (1857), 45 (*partly*), leaves 5–8 by 2–4½ in very unequal-sided obliquely ovate cuspidately acuminate coriaceous, base rounded or cuneate nerves very many uniform raised on both surfaces petiole 4–8 in channelled up to the limb peduncle 3–5 in long,

Schott (*ex Linnæa*), vi (1831), *Litterat Ber* 52

...00 ft, *Roxburgh, Griffith*

...ves coriaceous, drying pale ...ngular nervules *Spathe* ...pulvinate on a very short ...in long and the leaves as ...not distinguishable in the dried specimens I have seen no Ceylon specimens, for Thwaites' *R Peepla* is *R pertusa*

10 **R. gracilipes,** *Hook f* leaves 6–8 by 2 4 in broadly or narrowly oblong ovate unequal sided cuspidately acuminate submembranous opaque, base rounded or cuneate, primary nerves 14–16 pairs raised beneath widely spreading and arching, petiole 5–10 in very slender,

broad falcate acuminate, primary nerves 5–8 pairs spathe 5–7 in ovate-oblong beaked *Miq Fl Ind Bat* iii 185 *Engler Arac* 244 Scindapsus pertusus, *Schott Melet* i 21, *Kunth Enum* iii. 62 S Peepla, *Thw Enum* 336 Pothos pertusus, *Roxb Fl Ind* i 434 *Wight Ic* t 781 P. officinalis, *Wall Cat* 4436 G —*Rheede Hort Mal* xii t 20, 21

The DECCAN PENINSULA, Coromandel, Malabar, and southward to CEYLON — DISTRIB Malay Islands

A tall climber *Leaves* usually with oblong holes on one side, petiole about as long as the blade, deeply channelled, young winged wings not auricled at the top *Spathe* shortly peduncled. *Spathe* yellow *Ovaries* 4 angled, stigma sessile, pulvinate

15 **R. glauca,** *Schott in Bonpland* v (1857) 45, *Prodr* 382, leaves 6–10 in long and broad glaucous beneath pinnatisect, segments falcate linear or broader caudate-acuminate 2–7 nerved, petiole as long as the blade slender
late cuspidate
Schott Melet i
Schott Pothc

TROPICAL and SUBTROPICAL HIMALAYA from Nepal *Wallich* eastwards to

fine glaucous blue
towards the base

[illegible] very variable in size, longer than the spadix, yellow on both surfaces *Spadix* pale yellow *Stigma*

16 **R. eximia,** *Schott in Bonpland* v (1857) 45, *Prodr* 387, leaves 1–2 ft longer than broad oblong pinnatisect with 4–7 pairs of obliquely truncate acute 1-costate and many nerved segments, petiole very stout, spathe a foot long oblong cuspidate stigma raised on the conical top of the ovary R grandis, *Schott in Œstr Bot Zeit* 1858, 394, *Prodr* 386

[illegible] *nterbottom*, Sikkim,
alt

bright green on both
surf [illegible] orange yellow, out
side

17 **R. decursiva,** *Schott in Bonpland* v (1857) 45, *Prodr* 385,
cordate,
h several
y cymbi-
Engler
cursivus
Miq Fl
Ind Bat iii 186, *Thw Enum* 336 *Bot Mag* t 7282 Monstera decursiva, *Schott in Wien Zeitschr* 1829 (*Linnæa* (1831) *Literat Ber* 52) Pothos decursiva, *Roxb Fl Ind* i 436, *Wall Pl As Rar* ii 83 *excl the Attran plant*) P decurrens (*error for decursivus*), *Wall Cat* 4437 A, *in part*

grooved channelled up to the limb, spathe 3–4 in. cylindric long-beaked, stigmas raised pulvinate

PERAK, Larut, *Scortechini*, *King's Collector*.

(*Stem* 20–40 ft. by 1–1½ in diam, branches ½ in diam, *King's Collector*) *Leaves* pale gre[illegible]
Peduncle 1–2½ in [illegible]
shorter than the s[illegible]
closely resemble [illegible]

11 **R. Kunstleri,** *Hook f*, leaves 10–16 by 2½–5 in. oblong or oblong-lanceolate acuminate rather membranous, base acute or cuneate, primary nerves many spreading and arched prominent beneath, petiole 10–15 in. grooved channelled up to the blade, spathe 6–8 in. cylindric with a long stout beak, stigmas raised.

PERAK, at LARUT, *Kunstler* (*King's Collector*)

(*Stem* 40–60 ft, 3–4 in diam *Kunstler*), branches 5½ in diam. *Leaves* rigidly [illegible]

12 **R. Hookeri,** *Schott in Bonpland* (1857), 45, leaves 7–24 by 2½–12 in membranous oblong cuspidately caudate-acuminate, base unequal sided cuneate rounded or cordate, primary nerves very many spreading and arched, petiole 3–12 in. channelled up to the knee, spathe 2½–3½ in ovoid-oblong turgid, beak long slender, stigmas very broad orbicular pulvinate Pothos Peepla, *Wall Cat* 4444 (*in part*)

SIKKIM HIMALAYA, alt 1–4000 ft, *J D H* UPPER ASSAM, *Griffith* SILHET and KHASIA HILLS, alt 2–3000 ft, *Wallich*, &c MUNNIPORE, alt. 6000 ft, *Watt*

A lofty climber, stem as thick as the thumb *Leaves* the largest of the entire-leaved species, very thin in texture, dark green, drying a dull grey-brown, with a rather shining surface *Petiole* pale, not deeply channelled *Spathe* green, yellow within and along the outer margins, walls very thick, base rounded. *Spadix* short, stout *Ovaries* ¼ in diam, stigmas remarkably large for the genus

** Leaves perforated, pinnatifid, or pinnatisect.

13 **R. Beccarii,** *Engler Bot Jahrb* i. 181, *in Beccari Males* i 271, t 19, f 6–9, leaves narr[illegible]
pinnatifid with falcate [illegible]
6–10 in of young leaves [illegible]
cylindric acuminate, sti[illegible]
Beccarii, *Engler in Bull* [illegible]

PERAK, *Scortechini*, *King's Collector* —DISTRIB Siam, Borneo

Rootstock short, tufted, as thick as the little finger, creeping and rooting (or 15–20 ft, *King's Collector*) *Leaves* 10–15 by 4–8 in, unequal-sided, pale beneath, lobes [illegible] variabl[illegible] breadth, petiole channelled up to the limb *Spathe* dull [illegible]oured [illegible]tigmas in a drawing by Scortechini are sessile, very small and [illegible]er dried specimens they are large oblong or orbicular and [illegible]es them as oblong raised and cupped.

ASSAM; *Masters* KHA[illegible]
Stem as thick as the li[illegible]

broad falcate acuminate, primary nerves 5–8 pairs, spathe 5–7 in ovate oblong beaked *Miq Fl Ind Bat* iii 185, *Engler Arac* 244 Scindapsus pertusus, *Schott Melet* i 21, *Kunth Enum* iii 62 S Peepla, *Thw Enum* 336 Pothos pertusus, *Roxb Fl Ind* i 434 *Wight Ic* t 781 P officinalis, *Wall Cat* 4436 G—*Rheede Hort Mal* xii t 20, 21

The DECCAN PENINSULA, Coromandel, Malabar and southward to CEYLON — DISTRIB Malay Islands

A tall climber *Leaves* usually with oblong holes on one side, petiole about as long as the blade, deeply channelled, young winged wings not auricled at the top *Spathe* shortly peduncled. *Spathe* yellow *Ovaries* 4 angled, stigma sessile, pulvinate

15 **R. glauca,** *Schott in Bonpland.* v (1857) 45, *Prodr* 382, leaves 6–10 in long and broad glaucous beneath pinnatisect, segments falcate linear or broader caudate-acuminate 2–7 nerved, petiole as long as the blade slender channelled up to the blade, spathe 4–6 in oblong or lanceolate cuspidate *Engler Arac* 245, *Ic ined* 101 Scindapsus glaucus *Schott Melet* i 121, *Kunth Enum* iii 61 Monstera glauca *C Koch ex Schott* Pothos glaucus, *Wall Pl As Rar* ii 45 t 156, *Cat* 4440

TROPICAL and SUBTROPICAL HIMALAYA from Nepal *Wallich* eastwards to ... to 7000 ft

Leaves of a fine glaucous blue ... narrowed towards the base, ... *pathe* very variable in size, longer than the spadix, yellow on both surfaces *Spadix* pale yellow *Stigma* ...

16 **R. eximia,** *Schott in Bonpland* v (1857) 45, *Prodr* 387, leaves 1–2 ft longer than broad oblong pinnatisect with 4–7 pairs of obliquely truncate acute 1-costate and many nerved segments, petiole very stout, spathe a foot long oblong cuspidate, stigma raised on the conical top of the ovary R grandis *Schott in Œstr Bot Zeit* 1858, 394, *Prodr* 386

... *nterbottom*, Sikkim, alt ...

... bright green on both surf... orange-yellow, outside ...

17 **R. decursiva,** *Schott in Bonpland* v (1857) 45, *Prodr* 385, ... cordate, ... h several ... y cymbi... *Engler* ... cursivus ... *Miq Fl Ind Bat* iii 186, *Thw Enum* 336, *Bot Mag* t 7282 Monstera decursiva, *Schott in Wien Zeitschr* 1829 (*Linnæa* (1831) *Literat Ber* 52). Pothos decursiva, *Roxb Fl Ind* i 436, *Wall Pl As Rar* ii 83 *excl the Attran plant*) P decurrens (*error for decursivus*), *Wall Cat* 4437 A, *in part*

Sikkim Himalaya, alt 2–5000 ft, *J.D H* Khasia Hills, alt 0–4000 ft.

cen on both

lways more

Peduncle

18 **R. affinis,** *Schott in Bonpland* v. (1857) 45; *Prodr.* 385; leaves 1–2 ft longer than broad oblong base broadly cordate pinnatisect or pinnate, segments many pairs falcately ensiform acuminate narrowed at the base 1 costate with very slender lateral nerves, spathe 5–6 in oblong cymbiform purple cuspidate, stigma raised on the conical top of the ovary. *Engler Arac* 247

Khasia Hills

as far as my

very slender

19 **R. Korthalsii,** *Schott in Miq Ann Mus Lugd Bat* i 129, leaves oblong 1–2½ ft by 6–15 in pinnatisect longer than their petioles, segments many pairs linear falcate truncate acute 2–4-costate and many-nerved, spathes crowded 6–8 in, stigmas slightly raised *Engler Arac* 247.

Penang, *Maingay* (Kew Distrib 1555) Perak, *Scortechini*, *King's Collector* —Distrib Java.

Stem 30–40 ft, 2–3 in diam, branching above, densely crinite below the upper most leaves and inflorescences *Leaves* dark green, segments 3–8 in, base not contracted, petiole as thick as the little finger, sheathed up to the knee *Peduncles* 3–8 in, very stout *Spadix* 6–7 in cylindric *Ovaries* very small

20 **R. tetrasperma,** *Hook f*, leaves 5–7 in long and broad broadly ovate or orbicular cordate sparingly pinnatifid lobes cuspidate or acuminate, petiole rather shorter than the blade, spathe 1½–2 in turgidly cymbiform acute, placentas each 2 ovuled

Perak, *Scortechini*

Stem ¼–½ in diam, flexuous, terete rooting at the nodes, which are 3–4 in apart *Leaves* often very unequal sided, lobes 1–2, broad acute, 1–2-costate, petiole channelled up to the knee *Peduncle* 1–2 in, very stout *Spathe* white *Spadix* subclavate *Stigma* a raised furrow on the top of the ovary *Berries* full of intercellular needles —Scortechini figures and describes the ovary as 2 celled, with an erect ovule in each cell, but Mr Brown and I find 1 cell and 2 ovules on each placenta

26 EPIPREMNUM, *Schott*

Characters of *Rhaphidophora*, but the ovules are 1–3 anatropous on a nearly basal placenta, and the berries are not confluent —Species about 8, Malayan and Polynesian

This genus had better be merged in *Rhaphidophora*

1 **E. giganteum,** *Schott in Bonpland* v (1857) 45, *Prodr* 389, *leaves entire oblong obtuse base cordate, nerves very many* and close horizontal, spathe 6–10 in subsessile fusiform falcate woody *Engler Arac* 249 Scindapsus giganteus, *Schott Meletem* i 21, *Kunth Enum* iii 63 Monstera gigantea, *Schott in Wien Zeitsch* (1829), *ex Linnæa* 1831, *Litter Ber* 53 Pothos giganteus, *Roxb Fl Ind* i 434

Penang, *Roxburgh* Perak, *Scortechini*, *King's Collector*

A lofty climber, over 100 ft., stem 2-3 in diam *Leaves* 12-24 by 6-12 in bright green (drying yellow-brown) very coriaceous, shining above, costa very stout, nerves trabeculate by the rectangular nervules, petiole as long as the blade, winged
Spadix
of the
green
yellow
Herb

2 E. mirabile, ... *Prodr* 338, leaves entire ... ensiform falcate truncate ... broadly cordate, spathe ... *in Gard Chron* 1882 ... caudata, *Schott in Bon* ... 183 *Engler l c* 245 R pinnata and pinnatifida *Schott in Bonpland l c*, *Prodr* 384 R lacera *Hassk Cat Hort Bogor* 58 *Pl Jav Rar* 155 R Cunninghamii, *Schott in Bonpland* ix (1861) 367 Scindapsus caudatus, pinnatifidus and pinnatus, *Schott Meletem* i 21 *Kunth Enum* iii 62-63 S caudatus, *Engl l c* 248 Pothos caudatus *Roxb Fl Ind* i 436, *Wall Pl As Rar* ii t 192 P decursivus ... ii. 83 (*the Attran plant only*) decurrens (*error for* decursivus) pinnatifida *Schott in Wien* ... 52 *Rumph Herb Amb* v 489 t 183 f 2

MARTABAN and TENASSERIM *Wallich Falconer* PENANG, *Roxburgh* —DISTRIB Malaya Australia, Polynesia

A lofty climber stem stout 1 in diam, clothed above with a network of the ...

differing thus from all other species of *Pothos* known to him This species (if the identifications are correct with the Pacific plant) is the Tonga drug, much lauded in cases of rheumatism I am indebted to Mr Brown for unravelling the intricate synonymy of *E mirabile* and *Rhaphidophora decursiva*

3 **E. humile,** *Hook f*, dwarf, leaves entire ovate cordate acuminate, nerves spreading and arched, spathe 1-1¼ in cymbiform beaked Anadryum humile, *Schott in Miq Ann Mus Lugd Bat* i. 127, *Engler Arac* 181, *Ic ined* No 152

PENANG, *Maingay* (*Kew Distrib* 1560) PERAK, *Curtis Scortechini* —DISTRIB Sumatra

Rootstock as thick as the little finger, creeping (climbing?) *Leaves* 4-7 by ...

27 LASIA, *Lour*

A stout spinous marsh plant, rhizome branched and petiole peduncle and leaf nerves beneath all prickly *Leaves* long petioled, hastate, entire or pedately pinnatifid. *Spathe* very long, narrow, fleshy, twisted, base convolute deciduous *Spadix* short, cylindric, dense fld, flowering downwards *Sepals* 4–6, obovate tips truncate incurved *Stamens* 4–6, filaments short flat, anther-lobes parallel, slits extrorse *Ovary* ovoid, 1 celled, 1 ovuled, style stout, stigma depressed, ovule pendulous from the top of the cell, anatropous or semi-anatropous *Berries* obpyramidal, 6 sided, top warted or muricate *Seed* compressed, rugose, exalbuminous, embryo macropodal

L. heterophylla,

Pl 967

From tropical SIKKIM HIMALAYA ASSAM BENGAL, and BURMA, southwards to SINGAPORE and CEYLON — DISTRIB Malay Islds, China

Rootstock 1 in diam *Leav*
sagittate with broad or narrow
pinnatifid, base cordate lobes 1
towards the base *Peduncle* ab
claret colrd opening at the b
4–5 in and 1 in diam

28 PODOLASIA, *N E Br*

Habit and characters of *Lasia*, and like it prickly, but the leaves are always entire, the spathe short, open to the base, the ovule is laterally attached towards the base of the ovarian cells, and the berries are globose, quite smooth, and entirely exserted beyond the sepals

P. stipitata, *N E Br in Gard Chron* 1882, ii 70

bro
peti
mu
peti
¾ a
red

29 CYRTOSPERMA, *Griff*

Perennial warted or prickly herbs *Leaves* hastate *Spathe* expanded,
Spadix short dense
ncurved *Stamens*
xtrorse *Ovary* 1-
ll anatropous, pen
Berries crowded,

obovoidly globose, smooth, 1-7 seeded, scarcely longer than the accrescent sepals *Seeds* compressed, crested, albumen scanty, embryo hooked.—Species about 10 tropical

C. lasioides, *Griff Itin Notes* iii 149, *Notul* iii 150, *Ic Pl Asiat* t 169, leaves sagittate, lobes caudate acuminate petiole and peduncle prickly, flowers 6 merous ovules 2 *Schott Gen* t 84, *Prodr* 403, *Engler Arac* 270, *Ic Ined* No 89 —*Wall Cat* 4447

PERAK, in marshes, *Scortechini King s Collector* MALACCA, *Griffith* SINGAPORE *Gaudichaud* &c —DISTRIB Borneo

Rootstock stout *Leaves* like those of *Lasia* 2½-3 ft, basal lobes as long as the median costa and nerves prickly beneath petiole 2-8 ft sometimes as thick as the middle finger *Peduncle* shorter than the petiole *Spathe* 1-5 in, lengthen to 8 in f ... nerved ... pink s ... diam

30 ANAPHYLLUM, *Schott*

A tall herb with creeping rootstock *Leaves* broad, membranous pinnate or pedatipartite ... membranous, deciduous, ... dric, stipitate flowering ... large, obovate, truncat... cells saccate pores termi... stigma sessile disciform ... void

A. Wightii, *Schott Gen Aroid* t 83 *Prodr* 404, *Engler Arac* ... —*Wall Cat* 8968

TRAVANCORE, Courtallam *Wight*

Leaves 1 2 ft long or more leaflets 2-6 pairs sessile or petiolulate, ... 2-4 in, acuminate 1 costate, base cuneate rounded or acuminate, ... simple or divided petiole 3 4 ft quite smooth *Peduncle* longer than ... *Spathe* 6-12 by 2-4 in *Spadix* 1 in

31 POTHOS, *Linn*

... rooting *Leaves* ... eral shoots *Spathe* ... *Spadix* sessile or ... ing upwards, stipes often decurved or flexuous *Sepals* ... *Stamens* 6, filaments flat, anther cells ellipsoid, slits ... 3 celled, stigma small, ovules 1 in the inner angle of ... pous *Berries* 1-3 seeded *Seeds* exalbuminous, embryo ... Species about 20, tropical Asiatic, Australia and ... Madagascar

A *Leaves* with a broad flat truncate petiole, and ... *Spadix* (in the Indian species) very short, globose oblong ... long

1 **P. scandens,** *Linn Sp Pl* 968, leaves 2-4 in ... late peduncles ½-¼ in, bracts very small spathe ... spadix globose ovoid or shortly oblong *Bot Reg* t ...

175, *Schott Meletem* i 21, *Aroid* i 22, t 33, *Prodr* 563, *Roxb Fl Ind* ii 457, *Kunth Enum* iii 65, *Grah Cat Bomb Pl* 229, *Dalz & Gibs Bomb Fl* 257, *Wall Cat* 4435, *excl* D, E, F, *Engler Arac* 84 (*excl* var β) P exiguiflorus *and* cognatus, *Schott ll cc* 21, 22, t 41, 48 and 561, 562 P fallax, *Schott Prodr* 560 P decipiens *Schott in Bonpland* (1859), 165, *Prodr* 562 P Roxburghii, *De Vriese in Plant Jungh* i 103 —*Rheede Hort Mal* vii t 40

distinguished by the short peduncle is not even a constant variety, and there are not a few other Schottian species, that must go under *P scandens*

2 **P. Vriesianus,** *Schott Aroid* 22 t 36, *Prodr* 565, characters of *P scandens*, but bracts much larger, ¾ in long and broad, spadix larger erect inclined or deflexed *Engler Arac* 80 P Roxburghii, *Schott Aroid l c* t 37 (*not of de Vriese*) *Engler l c* 81 P scandens *Wall Cat* 4435

SIKKIM HIMALAYA alt 1–4000 ft, *J D H* BHOTAN, *Griffith*, SILHET *Wallich*

Almost exactly intermediate between *P scandens* of which it has the foliage, &c and *P Cathcartii*, which has larger but quite similar spathes and spadix De Vriese erred in supposing that Roxburgh's and Wight's plant differed from *scandens*

P. C[illegible] leaves 3 6 in [illegible] stout ⅓–⅔ in, [illegible] te suberect or [illegible] s, *Don Prodr*

[illegible]

broad and spadix ¼–½ in diam on a stipes ½–⅓ in long *Berries* ½–⅔ in long obovoid or oblong scarlet

4 **P. angustifolius,** *Presl Ep mel* 242 leaves 1½ 2 by ⅙–⅓ in linear apiculate, peduncle very short bracts small spathe lanceolate, spadix suberect minute globose or ellipsoid *Schott Aroid* i 21, t 31, *Prodr* 559 *Engler Arac* 81

TENASSERIM *Helfer*, &c

Stem much branched, branches short, as thick as a crow quill; internodes ¼–½ in *Leaves* ⅙–⅓ in broad, nerves parallel; petiole ⅛ ¼ in *Spathe* ⅛ in long *Spadix* 1/10–⅛ in diam

5 **P. Hookeri,** *Schott Aroid* i 23, t 46, *Prodr* 566, leaves 3–4 in lanceolate acuminate, peduncle 1½–2¾ in decurved, bracts ovate acute, spathe cymbiform acuminate, spadix oblong P scandens, *Hook Ic Pl* t 175 P scandens, *var* Hookeri, *Engler Arac* 84

CEYLON, *Walker*.

Stem and foliage as in the common state of *P. scandens* and *Vriesianus*. *Peduncle* often longer than the petiole *Spathe* $\frac{1}{2}$–$\frac{2}{3}$ in. *Spadix* $\frac{1}{3}$–$\frac{1}{2}$ in, its stipes about as long.

6 **P. macrocephalus,** *Scort. mss*, leaves lanceolate apiculate, petiole as long as the blade, peduncle $1\frac{1}{3}$–2 in decurved, spathe ovate-cordate or orbicular cuspidate, spadix globose or shortly pyriform

there may prove forms of one

B *Petiole* (*knee* only) very short, sheath very long, split to the base *Spadix* long, sessile or stipitate

* *Spadix cylindric, dense-fld, flowers not in clusters*

7. **P. Kingii,** *Hook f*, stout, leaves 6–10 by 3–4 in oblong or oblong-lanceolate caudate acuminate, base narrowed rounded, bracts $1\frac{1}{2}$–2 in, spathe 4–6 in ovate-lanceolate

ft

s 2–3 ft, pale *Leaves* coria- petiole $\frac{1}{4}$ in, sheath 3–4 in, *Spathe* dark purple within, r, style very short, stigma penicillate

8 **B. Barberianus,** *Schott Aroid* 24 t 53, *Prodr* 573, leaves 3–5 by $1\frac{1}{3}$–$1\frac{3}{4}$ in oblong- or ovate lanceolate acuminate base rounded, sheath clasping the branch, peduncles terminal and axillary, spathe linear-lanceolate *Engler Arac* 90.

Borneo

thinly coriaceous, tip in broad, biauricled adix as long, sessile

Stigmas pulvinate, sessile

P. W.

gracilis by Roxburgh in mss

curved Sepals about equalling the ovary —Sweet Flag

474, midrib 0 *Schott* *th Fl Hongk* 345 A Tatarinovii, *Schott in* restris, *Engler l c* 217

SIKKIM HIMALAYA alt 6000 ft *J D H* KHASIA HILLS, alt 4–5000 ft, *Griffith* &c —DISTRIB China, Japan

Much more variable in size than *A Calamus*, from 6 in to 3 ft, with a shorter spathe and more slender spadix

ORDER CLXVII LEMNACEÆ.

Minute or small annual floating green scale like plants, rootless or with capillary roots, propagated by budding or by hybernating bulbils, rarely by seed *Flowers* 1-3, naked or in a spathe, perianth 0 *Stamens* 1-2, anthers 1 or 2 celled *Ovary* 1 celled, style short, stigma truncate or funnel shaped, ovules 1–7 *Utricle* bottle shaped *Seeds* 1 or more testa coriaceous, albumen 0, or fleshy, embryo axile, cylindric —Genera 2 or according to various authors 3 or 4 Species about 20, in all countries

1 LEMNA, *Linn*

Fronds with one or more roots, bearing the flowers in marginal clefts *Filaments* slender, anthers 2 celled *Ovules* 1-7 —Species 17, natives of all countries

L obcordata Ham in Wall Cat 5201 is a species of *Riccia*

1 **L minor,** *Linn Sp Pl* 976, root solitary, frond symmetrical obovoid or oblong nearly flat on both surfaces, ovule solitary *Kunth Enum* iii 4 *Reichb Ic Fl Germ* vii t 14 *Hegelm Lemnæ*, 141, t 9, 10, *Boiss Fl Orient* v 29 *Kurz in Journ Linn Soc* ix 266

Throughout INDIA? WESTERN TIBET, to 9000 ft, *Thomson* —DISTRIB Cosmopolitan

Frond ⅛ ¼ in long young sessile on the old but soon detached, green above, epidermal cells with flexuous walls *Root sheath* not appendaged, cap obtuse *Spathe* 2 lipped *Stamens* 2 (each a male fl) *Style* long *Seed* horizontal, hemianatropal, albuminous —Kurz (Journ Linn Soc xi 266) thinks that *L minor* does not occur in India proper If this be so, *L paucicostata* has been mistaken for it a point I must leave it for local botanists to clear up Hegelmaier gives the Caucasus and W Tibet as the only Asiatic habitats

2 **L paucicostata,** *Hegelm Lemnæ*, 139, t 8, root solitary, frond asymmetrical obovate or obovate oblong nearly flat on both surfaces ovule solitary *Boiss Fl Orient* v 30 L minor, *Griff Notul* iii 216, *Hegelm in Seem Journ Bot (1865)*, 112, *Thw Enum* 331

In various parts of INDIA and CEYLON; ascending the Khasia Hills to 6000 ft.—DISTRIB Cosmopolitan tropical

Distinguished from *L minor* by the asymmetric fronds, appendaged root sheath, acute root cap, and erect orthotropous seed

3 **L. gibba,** *Linn Sp Pl* 970, root solitary, frond orbicular or

obovoid tumid beneath, ovules 2–7 *Reichb Ic Fl Germ* vii t 14, *Boiss Fl Orient* v 30, *Hegelm Lemnæ*, 145 t 11–13 Telmatophace gibba *Schleid in Linnæa*, xiii 391, *Kunth Enum* iii 6, *Kurz in Journ Linn Soc* ix 266—Lemna, *Griff Notul* iii 221 (2nd species), *Ic Pl Asiat* t 263

Still waters throughout INDIA, ascending to 7000 ft in the Himalaya —DISTRIB Cosmopolitan

Frond ⅛–⅙ in diam, opaque young sessile, cells beneath very large epidermis with flexuous walls *Root-sheath* elongate cylindric, root cap acute *Stamens* 2 *Utricle* circumciss *Seeds* erect, anatropous albumen scanty or 0

4 **L. trisulca,** *Linn Sp Pl* 970 root solitary frond oblanceolate tip serrate young hastate persistent, ovule solitary *Kunth Enum* iii 5 *Reichb Ic Fl Germ* vii t 15, *Hegelm Lemnæ* 134 t 5, 6 *Boiss Fl Orient* vi 29, *Dalz & Gibs Bomb Fl* 281 L cruciata *Roxb Fl Ind* iii. 566—Lemna, *Griff Notul* 218 *Ic Plant Asiat* t 262

PANJAB, *Stewart* BENGAL The CONCAN, MUNNEPORE, and BURMA —DISTRIB Temp and trop regions

Fronds ⅓–½ in long, young on one or both sides placed cross wise to the old, epidermis 0 *Root cap* acute *Style* very short *Seed* hemianatropous horizontal testa rough, grooved

5 **L. polyrrhiza,** *Linn Sp Pl* 970, roots many frond herbaceous broadly obovate or orbicular flat or nearly so 7 nerved ovules 1–2 erect *Reichb Ic Fl Germ* vii t 15 *Thw Enum* 331, *Kurz in Journ Linn Soc* ix 267 L orbiculata *Roxb Fl Ind* iii 565 L major *Griff Notul* iii 216, *Ic Plant Asiat* t 264 (*anal*) Spirodela polyrrhiza, *Schleid in Linnæa* xiii 392 *Kunth Enum* iii 7, *Hegelm Lemnæ*, 151, t 13–15, *Boiss Fl Orient* v 30

—DISTRIB Temp and trop regions
usually purplish beneath, epidermal
Stamens 2 *Ovules* 1 2 semianatro
uch larger fronds, green on both sur
faces, as occurring under trees in Bengal

6 **L. oligorrhiza** *Kurz in Journ Linn Soc* ix 267, t 5 roots few, fronds membranous ovate or oblong 3 5 nerved *Benth Fl Austral* vii 163 Spirodela oligorrhiza *Hegelm Lemnæ* 147 t 16 S melanorrhiza and pleiorrhiza *F Muell ex Kurz in Seem Journ Bot* (1867) 115

BENGAL, *Kurz*, and elsewhere in India —DISTRIB Trop Asia, Australia, Polynesia

minor

2 WOLFFIA *Horkel*

Fronds like grains of sand, rootless proliferous, bearing the flowers on the upper surface *Spathe* 0 *Anthers* sessile, 1 celled *Style* short, stigma depressed, ovule 1, erect

1 **W. arrhiza,** *Wimm Fl Schles* 140, fronds subglobose W Michelii, *Schleid Beitrag Bot* 233 W Delilii *Kurz in Journ Linn Sc*

Marshes, &c of the LOWER HIMALAYA, alt 1-7000 ft, from Kashmir to Munnepore and Burma —DISTRIB N and S temp regions

Rootstock fleshy, swollen *Leaves* 6-8 in, erect or spreading *Scape* 1-4 ft *Flowers* in panicled whorls, ¼ in diam., petals pink or rose with a yellow claw *Achenes* 20-30, in a single whorl, style ventral —A small state found in Kashmir, alt 7000 ft, by *Clarke resembles A ranunculoides, but the carpels are in one whorl,* though irregularly disposed

Marshes &c, throughout the plains and low country of India, ascending the hills to 5000 ft (not in Ceylon) —DISTRIB Australia

Leaves coriaceous 1½-4 in (up to 7 in broad), often broader than long, tip rounded or emarginate, nervules very fine and close *Scape* 1-3 ft *Flowers* white ⅓ in diam, in very large whorled panicles, branches and pedicels long, sepals as

3 **A. oligococcum,** *F Muell Fragm Phyt Austral* i 23, leaves membranous broadly ovate-cordate with acute lobes and a narrow sinus punctate 11-17 nerved, bracts very large lanceolate fruiting sepals reflexed achenes 2-6 whorled turgid dorsally keeled keels tubercled, endocarp thick hard style very short terminal deciduous *Benth Fl Austral* vii 185 *Micheli in DC Monog Phan* iii 37 A glandulosum, *Thw Enum* 332 A apetalum, *Ham in Wall Cat* 4996

Marshes &c in the plains of the PANJAB and BENGAL but not common CEYLON, *Thwaites* —DISTRIB Africa trop, Australia

Leaves 3 6 in long by 2-3 in broad nervules distant *Panicle* 6-9 in long and broad, bracts herbaceous lower 1-3 in long, lanceolate *Flowers* of *L Plantago*

2 LIMNOPHYTON, *Miquel*

An erect succulent marsh plant, with the characters of *Alisma*, except that the flowers are polygamous

L. obtusifolium, *Miq Fl Ind Bat* iii 242, *Micheli in A DC Monogr Phan* iii 39 Alisma sagittifolium, *Willd Sp Pl* ii 277, *Kunth Enum* iii 151 A Kotschii, *Hochst in Flora*, 1843, 499 A obtusifolium *Thw Enum* 332 Sagittaria obtusifolia, *Linn*, *Kunth Enum* iii 158, *Roxb Fl Ind* iii. 646, *Dalz & Gibs Bomb Fl* 249, *Wall Cat* 4992 Dipseudochorion sagittifolium, *Buchen in Flora*, 1865, 241 —*Rheede Hort Mal* xi t 45

[illegible] in tanks, &c CEYLON, *Thwaites* —

Leaves 6 12 by 4-8 in, reniformly spreading lobes, many-nerved, petiole [illegible] ¼-½ in diam white, upper mostly male *Sepals* reflexed after flowering *Petals* obovate *Stamens* 6 filaments of the male enlarged at the base *Achenes* numerous, turbinate turgid epicarp fleshy, style ventral, stigma capitate

3 SAGITTARIA, *Linn.*

Erect stemless, usually perennial water plants *Leaves* long petioled, elliptic cordate or sagittate *Flowers* in panicled or spicate whorls, unisexual or polygamous *Sepals* 3 herbaceous *Petals* 3, membranous, deciduous *Stamens* 6 or more, filaments filiform, compressed *Carpels very many, crowded on a large globose or oblong receptacle,* laterally flattened, style ventral or ap cal stigma papillose, ovules solitary, basilar *Fruit* a globose or oblong head of flattened crested or winged achenes *Seeds* erect testa thin, embryo hippocrepic —Species about 15, temperate and tropical

1 **S. sagittifolia,** *Linn*, leaves hastate or sagittate, achenes flat dorsally winged *Kunth Enum* iii 156, *Roxb Fl Ind* iii 645, *Wall Cat* 4991, *Reichb Fl Germ* vii t 53, *Boiss Fl Orient* v 11, *Micheli in A.DC Monogr Phan* iii 66 S hermaphrodita, *Ham in Wall Cat l c* S hastata, *Don Prodr* 22 S Doniana, *Sweet, Hort Brit* 1826

In tanks, &c, throughout the plains of INDIA from the Panjab to Bengal and Munnipore —DISTRIB Europe N Asia N America

Leaves obtuse or acute 2–8 in long very rarely elliptic or lanceolate, lobes more or less diverging petiole 8–18 in trigonous *Scape* 6 18 in, with 3–5 whorls of 3–5 flowers each ½ in d am lower whorls fem upper male, with longer pedicels, bracts short obtuse *Flowers* ¾ in diam petals white claw often purple *Achenes* obliquely obovate, apiculate, wings broad entire or subcrenate

[illegible]

Wall Cat (*ex Micheli*) Alisma? Hamiltonianum and cristatum, *Wall Cat* 4993, 4994, 499[illegible] A stellatum and pubescens, *Ham ex Wall Cat* 4993, 4995 Lophiocarpus guayanensis, *Micheli in A DC Monogr Phan* iii. 62

In tanks and marshes throughout the plains of INDIA to BURMA and the MALAY PENINSULA but not very common, (not in Ceylon) —DISTRIB Malay Islands, China trop Australia

Petioles, scape and *pedicels* often more or less hairy *Leaves* 1–2 in, membranous, lobes broad acute or obtuse, sinus broad or narrow, nerves radiating, obscure, petiole long or short *Scape* 6–18 in, stout *Flowers* ⅓ in diam, white, in few approximate irregular whorls, pedicels short, very stout, flowers of the lower whorls usually ternate, bisexual, 9 12 androus, of the upper more numerous, male, 6–10 androus *Petals* obovate, erose *Anthers* cordate at the base *Achenes* very many

4 WISNERIA, *Micheli*

Scapigerous marsh or water herbs *Leaves* long petioled, filiform lanceolate or oblanceolate *Flowers* minute monœcious, in remote involucrate whorls on a very slender rachis, involucre campanulate truncate, membranous *Sepals* 3, *equal or one larger, persistent* *Petals* 2–4, equalling or smaller than the sepals MALE FL. *Stamens* 3 *Pistillodes* subulate FEM FL *Staminodes* setaceous *Carpels* 3–6, erect, ovoid, receptacle small tumid style 0, or terminal short, stigma minute, ovule solitary, basilar *Achenes* and *seed* subglobose or compressed, embryo conduplicate, hyppocrepic —Species 3, Trop Asia, Africa, and Madagascar

W triandra, *Micheli in A DC Monog Phan* iii 82, sepals and petals 3 each, achenes subglobose, stigma sessile Sagittaria triandra, *Dalz in Hook Journ Bot* ii (1850), 144, *Dalz & Gibs Bomb Fl* 249

mid
thar
oblc
few, subglobose or obovoid, smooth

5 BUTOMUS, *Linn*

otstock *Leaves* terete. *Flowers* and *petals* both hypogynous, fila- fter dehiscence *Carpels* 6, whorled on a flat receptacle, connate below, stigma ventral elongate furrowed, ovules many, scattered, parietal, ascending *Fruit* of 6 coriaceous beaked many seeded follicles *Seeds* linear oblong, furrowed, embryo straight

B umbellatus, *Linn*, *Kunth Enum* iii 164, *Reichb Ic Fl Germ* vii t 58, *Boiss Fl Orient* v 12, *Wall Cat* 7244

The PANJAB and KASHMIR, in marshes, &c, alt 1–5000 ft — DISTRIB Europe; N Asia

Leaves 3–4 ft by ½ in broad, acuminate, base sheathing *Umbel* many fld, bracts 3, pedicels 2–4 in *Flowers* 1 in diam

6 BUTOMOPSIS, *Kunth*

An annual marsh herb with mi in solitary or superposed bractea petals larger than the sepals 8–12, anthers oblong *Follicles* many, minute, smooth

Dalz & Gibs Bomb Fl 249, *A DC Monog Phan* iii 87 olatus, *Roxb Fl Ind* ii 315, 22 B Dobia, *Ham in Wall l c* Tenagocharis cordofana, *Hochst in Flora* (1841), 369

PLAINS OF INDIA, from Rohilkund to Assam and the Deccan — DISTRIB tropics of the old world

Very variable in stature and stoutness *Leaves* 2–8 in, broad or narrow, 3 7 nerved acute obtuse or apiculate *Scape* as long as the leaves, stout or slender *Umbels* 3–20-fld., bracts few, short, scarious, pedicels 2–8 in, erect *Flowers* ½–1 in diam, sepals ovate or orbicular, petals longer obovate *Stamens* 8–10, filaments rather slender, anthers oblong *Follicles* 6 7, tapering into short beaks, membranous, connate below

ORDER CLXX. NAIADACEÆ

Aquatic or marsh herbs of various habit *Rootstock* usually creeping *Stems* usually elongate (short or 0 in *Triglochin*) branched *Leaves* erect,

or submerged or floating base sheathing, stipules 0 or within the sheath. *Flowers* inconspicuous, usually green, 1–2 sexual *Perianth* 0, or tubular, or of 3–4 inferior valvate segments *Stamens* hypogynous, anthers 1–2 celled *Ovary* of 1–4 1 ovuled carpels, style long or short, stigma various, ovule erect or pendulous *Fruit* of 1 seeded utricles achenes or drupelets *Seed* exalbuminous, embryo straight or curved radicular end very large —Temperate and tropical, genera 16 sp about 120

* Stigmas discoid or decurrent on the ovary

† *Perianth of sepals or scales. Flowers bisexual*

Marsh herbs Sepals 6 herbaceous green	.	1 TRIGLOCHIN
Aquatics Sepals 1–3, white, membranous	.	2 APONOGETON
Aquatics Sepals 4, herbaceous green	.	3 POTAMOGETON

†† *Perianth* 0 *Flowers* [illegible] *or bi sexual*

Aquatics Stamen 2 Carpels stipitate .	.	4 RUPPIA
Aquatics Stamen 1 Carpels sessile		5 ZANNICHELLIA

** Stigmas subulate or capillary Flowers unisexual

Fresh or brackish aquatics Perianth hyaline	6 NAIAS
Marine Perianth 0	7 [illegible]

1 TRIGLOCHIN, *Linn*

Scapigerous marsh herbs *Leaves* rush like, flat or terete *Fl*[illegible] small, bisexual spicate or racemose 2 bracteate *Perianth*[illegible] herbaceous, concave, deciduous *Stamens* 6, inserted on the [illegible] segments, anthers didymous slits extrorse *Carpels* 6, 1-celled, [illegible] 3 alternate often imperfect, styles short, often connate, [illegible] cillate, ovules basilar, erect, anatropous *Fruit* of [illegible] connate achenes or follicles with recurved tips *Seed* [illegible] straight —Genus cosmopolitan species about 12

1 **T palustre,** *Linn Sp Pl* 338, leaves ½-terete [illegible] clavate, carpels 3 slender attached to the axis by a point [illegible] iii 143, *Reichb Ic Fl Germ* vii t 51, *Boiss Fl Orient* [illegible] glochin, *Griff Notul* iii 204, *Ic Pl Asiat* t 271

TEMPERATE and ALPINE HIMALAYA, and WESTERN TIBET [illegible] ft.—DISTRIB N temp regions and S America

Stem 6–24 in, tuberous and stoloniferous *Leaves* 2–12 [illegible] slender, raceme elongating after flowering, pedicels short *Per*[illegible] purplish *Anthers* purple *Fruit* ¼ in long, appressed [illegible] dorsally terete

2 **T maritimum,** *Linn Sp Pl* 339, leaves [illegible] the tip, fruit oblong of 6 separable carpels *Kun*[illegible] *Reichb Ic Fl Germ* vii. t 52, *Boiss Fl Orient* v 1[illegible]

TEMPERATE and ALPINE HIMALAYA, and WESTERN T[illegible] ft —DISTRIB N temp regions

Larger, stouter and more tuberous at the base than T [illegible] curved, raceme longer, but not elongating so much in [illegible] ¼ in, not appressed to the scape, carpels grooved on the [illegible]

2 APONOGETON, Thumb

Submerged scan ... ting or erect, oblong ... often unilateral or d ... iclosed in a conical d ... unequal white segments *Stamens* 6 or more, filaments subulate, unequal, persistent, anthers didymous *Carpels* 3-6, 2 or more ovuled, style short, stigma discoid or decurrent persistent, ovules basilar, anatropous *Fruit* of 3 or more coriaceous follicles *Seeds* erect, embryo straight —Species about 20, Asiatic, African and Australian

1 **A monostachyon,** *Linn f Suppl* 214, leaves floating oblong ... , sepals 2 shorter ... 8, t 81, *Fl Ind* ... *Griff Notul* iii ... 406 A monostachys, *Edgew in Hook Lond Journ Bot* iii (1844) 405, t 17 A lucens *Herb Madr* A flavidum, *Herb Ham* Spathium monostachyum *Edgew in Calc Journ Nat Hist* iii (1843), 533, t 16 Potamogeton indicus *Roth ex Roem & Sch Syst* iii 576 Saururus natans, *Linn Mant* 227 — *Rheede Hort Mal* ii t 15

Tanks, &c, throughout INDIA and CEYLON —DISTRIB Trop Asia and Australia

Leaves 3-6 in, acute or obtuse, herbaceous, base cuneate rounded or cordate *Spike* 1-6 in, lax or dense fld *Sepals* obovate to lanceolate *Stamens* 6 *Seeds* oblong —Submerged leaves membranous transparent and with distinct cross nervules as in *A crispum*

2 **A crispum,** *Thunb Nov Gen* i 73, leaves submerged from linear oblong to lanceolate 3-7 nerved membranous translucent cross nervules ...
1-2 see
211, I
Ouvira
t 18
533, t

Tanks throughout INDIA and CEYLON —DISTRIB Australia

Leaves 1-3 ft, flat or undulate, base acute rounded or cordate *Sepals* very variable in size if two species be not confounded under this name Roxburgh describes them as in *monostachyon* ' but in some specimens they are fully ½ in long

3 **A echinatum,** *Roxb Fl Ind* ii 210, leaves floating linear-oblong 3-5-nerved opaque cross nervules obsolete, spike solitary, sepals shorter than the 3 echinate 2 seeded follicles

... figures on the plate of *A monostachyon*, apart from the enlarged 6 seeded follicles of that plant 3 others carpels which are strongly echinate and 2 seeded, and to which he doubtless alludes under his description of the former,

saying, "There is a var if not a distinct species with hedgehog 2-seeded capsules, but in all other respects the same"—It follows that he, by inadvertence, describes the follicles of *A echinatum* as 6 seeded

4 **A. microphyllum,** *Roxb Fl Ind.* ii 211, leaves very small oblong long petioled sides incurved, spike solitary, sepals much larger than the 3 smooth 1-2 seeded follicles, seeds globose Spathium microphyllum, *Voigt Hort Suburb Calcutt* 694

BHOTAN MTS, in damp places, *Roxburgh*

I have seen no specimens, and Roxburgh's description differs much from a drawing in his collection The latter represents a plant seven inches high, with a smooth naked tuber, four leaves with sheathing petioles 1½ in long blade ½ by ¼ in concave recurved, apparently oblong acute and quite opaque spike 1½ in, clothed with spreading white sepals ¼ in long, and red brown anthers Roxburgh, on the other hand, describes the leaves as many times shorter than the spike spreading close to the surface of the earth, 1 in long by ½ broad, and the spike as everywhere covered with beautiful blue flowers The globose seeds are remarkable

3 POTAMOGETON, *Linn*

Submerged water plants with creeping rootstock *Leaves* submerged or floating, opposite or alternate, entire or toothed, stipules intrafoliaceous *Flowers* small, spicate on a scape rising from a membranous spathe, ebracteate *Perianth segments* 4, concave, green, valvate *Anthers* 4, sessile on the segments, didymous, slits extrorse *Carpels* 4, sessile, 1 celled, 1-ovuled, stigma subsessile or decurrent, persistent, ovule inserted in the inner angle of the cell, campylotropous *Drupelets* small, coriaceous or spongy *Seed* subreniform, embryo macropodal —Species about 50, cosmopolitan

In determining the Indian species of *Potamogeton* I have had the invaluable aid of Mr Arthur Bennett, F L S whose knowledge of the genus is as full as it is accurate

* *Upper or all the leaves floating*

1 **P. indicus,** *Roxb Fl Ind* i 452, upper leaves floating oblong elliptic or elliptic-lanceolate coriaceous, lower submerged longer narrower membranous, stipules 1-1½ in free, spike dense-fld, drupelets small smooth *Kunth Enum* iii 139, *Don Prodr* 21, *Wall Cat* 5175 *excl* F., *Grah Cat Bomb Pl* 200, *Dalz & Gibs Bomb Fl* 248 P Roxburghianus, *Schult f Mant* iii 367. P. natans, *Thw Enum* 333

[illegible]

smaller drupelets

2 **P. natans,** *Linn Sp Pl.* 126, upper leaves floating oblong elliptic or elliptic-lanceolate biplicate at the insertion of the petiole, submerged few or 0, stipules 4-5 in free spikes dense fld, peduncle stout, drupelets dorsally keeled shortly beaked *Kunth Enum* iii 127. *Reichb Ic Fl Germ* vii t 50, *Boiss Fl Orient* v 15, *Aitch Cat Panjab Pl* 115. P rufescens, *Aitch l c* 145

The PANJAB, *Thomson* KASHMIR, alt 5000 ft, *Jacquemont*, &c —DISTRIB widely diffused especially in temp climates

Stem terete *Leaves* 2–6 in ; submerged (if present) sessile, long narrow, and without a limb *Peduncle* stout *Drupelets* ⅛ in long

3 **P oblongus,** *Viv Fl Ital* 2, t 13, floating leaves long petioled elliptic or lanceolate thinly coriaceous, submerged narrowly lanceolate, stipules 1½ in peduncle and dense fld spike very slender, drupelets minute shortly beaked not keeled *Engl Bot* t 2849 P polygonifolius, *Pourr in Mem Acad Toul* iii (1788) 325, *Hook f Students' Brit Fl Ed* 3, 431 P digynus *and* P elegans, *Wall Cat* 5177, 5178

NEPAL, *Wallich* KHASIA HILLS, alt 4 5000 ft *J D H & T T* SINGAPORE? *Wallich* —DISTRIB Temp and trop. regions of the old world

The more membranous leaves shorter stipules, very slender peduncle and spike, smaller flowers and minute drupelets not $\frac{1}{16}$ in long, distinguish this from *P natans*

4 **P javanicus,** *Hassk in Verh Natuurk Ver Ned Ind* i (1856), 26, floating leaves sm
5–7-nerved longer than
½–1 in, peduncle slende
often toothed or tubercle
tenuicaulis, *F Muell I*
parvifolius, *Buchen in*
Ham in Wall Cat 5181 P hybridus, *Mich ? Herb Ind Or Hf & T*

Plains of INDIA, ascending the Himalaya to 7000 ft in the N West, and 9000 ft in Sikkim KHASIA HILLS, alt 6000 ft —DISTRIB Trop Asia, Africa and Australia

Stem very slender *Leaves* ⅓–1½ in, blade twice as long as the petiole or longer *Spike* ⅓–½ in flowers very small in interrupted whorls peduncle as long or longer *Sepals* orbicular obovate *Drupelets* $\frac{1}{12}$ in, turgid, beak stout

** *Leaves all submerged, ovate oblong or broadly linear, translucent*

5 **P. perfoliatus,** *Linn Sp Pl* 126, stem stout leaves amplexicaul ovate cordate entire 5–9 nerved, peduncle short stout, drupelets hardly keeled shortly beaked *Kunth Enum* iii 133 *Reichb Ic Fl Germ* vii t 29, *Boiss Fl Orient* v 17, *Dalz & Gibs Bomb Fl* 248

WESTERN HIMALAYA, from Kashmir to Kumaon alt 4 8000 ft WESTERN TIBET, alt 8–14 000 ft.—DISTRIB N temp regions Australia

Stem terete, dichotomous *Leaves* 1–4 in, margins scaberulous, upper opposite, stipules small, caducous. *Peduncle* stout, not thickened upwards *Spike* dense fld *Sepals* long-clawed *Drupelets* $\frac{1}{10}$ in, compressed beak straight.

6 **P. crispus,** *Linn Sp Pl* 126, stem slender, leaves semiamplexi-

22.

PLAINS of INDIA and TEMPERATE HIMALAYA, from Kashmir to Bhotan, alt 4–6000 ft MUNNIPORE, *Watt* —DISTRIB N and S temp and subtrop regions

Stem dichotomous compressed *Leaves* 1–3 in, alternate and narrowed at the base, or opposite and amplexicaul, tip rounded, stipules small, caducous *Peduncle*

long *Spike* very short, few fld, flowers very small *Drupelets* $\frac{1}{8}$ in, obliquely ovoid, compressed, ribs entire or toothed

7 **P. lucens,** *Linn Sp Pl* 126, stem stout, leaves large subsessile oblong lanceolate cuspidate undulate serrulate many nerved, peduncle stout thickened upwards, spike stout, drupelets small turgid shortly beaked *Kunth Enum* iii 132, *Reichb Ic Fl Germ* vii t 36, 37, 40, *Boiss Fl Orient* v 16

hey &

float

both

BENGAL, at Dinagepore and Kulna and Karnata *Hamilton* —DISTRIB Borneo Philipp Islds

Leaves 3–5 by $\frac{1}{2}$–$\frac{2}{3}$ in, 5–9 or more nerved blade twice or thrice as long as the petiole, stipules 1–$1\frac{1}{2}$ in *Spike* $1\frac{1}{2}$–2 in, flowers laxly crowded or whorled *Sepals* suborbicular, very shortly clawed *Fruit* $\frac{1}{8}$ orbicular, shortly beaked —Has a good deal the aspect of *P lucens,* to which Hamilton referred it The specimens are very poor and insufficient for a satisfactory diagnosis

*** *Leaves all submerged very narrowly linear or filiform*

9 **P. pectinatus,** *Linn Sp Pl* 127, leaves filiform acute opaque 1–3 nerved, margins slightly
drupelets large turgid smoo
Reichb Ic Fl Germ vii t 1
Pl 145 P marinus? *Ham*
subsessilis, *Thu Enum* 333, *in part*

Plains of INDIA, the HIMALAYA, and WESTERN and EASTERN TIBET, alt. 12–17,000 ft CEYLON, *Thwaites* —DISTRIB most regions

Stem filiform, densely distichously branched *Leaves* 3–8 by $\frac{1}{10}$–$\frac{1}{5}$ in, lower sometimes 5-nerved *Peduncle* not thickened upwards, flowers interruptedly whorled *Drupelets* $\frac{1}{8}$ in, dimidiate obovoid

10 **P. pusillus,** *Linn Sp Pl* 127, leaves narrowly linear or filiform acute usually 3 nerved membranous, stipules small free, peduncle long filiform, flowers few minute clustered, drupelets turgid stoutly beaked obtusely keeled *Kunth Enum* iii 136, *Reichb Ic Fl Germ* vii t. 22, *Boiss Fl Orient* v 18, *Wall Cat* 5180

KASHMIR, alt 5000 ft, *Thomson* —DISTRIB N and S temp regions

Stem filiform densely distichously branched *Leaves* $\frac{1}{2}$–3 in, rarely acuminate, rarely 5–7 nerved *Spike* 6–10 fld *Drupelets* obliquely ovoid

Subsp *flabellatus,* Hook f, Students Brit Fl 436, leaves $\frac{1}{12}$ in broad 3–5-nerved P flabellatus *Bab in Proc Linn Soc Ser* ii (1853), *nom*, *in Phytologist,* iv 1158 P marinus? *Ham in Wall Cat* 5179 B *in part* —Upper Bengal, Patna, *Wallich* The Panjab, *Thomson* —DISTRIB Britain

4 RUPPIA, Linn

Submerged slender branch
filiform, sheaths stipuliform
the leaf-sheath on a short ped
twisted Perianth 0 Anthers
uled at length (in fruit) long-
Achenes ovoid, obtuse or
—Species temperate and sub-
tropical

Ic Fl Germ
ovoid acutely
l in 196, Ic

THROUGHOUT INDIA and in CEYLON, in brackish water —DISTRIB Europe temp and trop Asia

Stem 2 ft and upwards *Leaves* 1–3 in *Fruiting peduncle* 1–6 in *Achenes* $\frac{1}{12}$ in long

5 ZANNICHELLIA, Linn

Submerged salt water *Leaves*
linear, sheaths stipular heaths, a
male and fem in one me -3 celled
anther, filament slender *Carpels*
2–9 sessile, style long e, ovule
solitary, pendulous, orthotropous *Achenes* 4, sessile or stipitate, reniform, crested *Seed* pendulous, testa thin, embryo subcylindric, cotyledonary end twice folded on itself —Species 4–5, or forms of one

Z PEDICELLATA, male peduncle
ibercled, style as long as
Aschers Fl Brandenb
t 31 f 2 Z pedun-
t 760 Z gibberosa,
Reichb l l c c t. 16 and t 759 *Ic Fl Germ* vii t 21, 22 Z pedicellata, *Ham in Wall Cat* 5185, *Griff Notul* iii 190, *Ic Pl Asiat* t. 255, 256

Salt marshes and lagoons throughout INDIA, ascends to 15,000 ft in W Tibet —

Western Tibet,
crenate, style
essile achenes
long, c, from
ry slender, d,
om the Panjab
style shorter
than the achene

6 NAIAS, Linn

Leaves
minute,
tubular
, adnate

to the inner perianth, apiculate or cuspidate 1-4 celled *Fem perianth* 0, or hyaline and adherent to the carpel *Carpel* 1, sessile, 1 ovuled, stigmas 2-4, slender, ovule basilar, erect, anatropous *Achene* oblong *Seed* erect, testa very thin, embryo straight —Species about 10, temperate and tropical

The Indian species of this genus require a very close examination, which I regret to say I have not materials in flower and fruit sufficient to enable me to undertake

1 **N. major,** *All Fl Pedem* ii. 221, stem terete toothed, leaves linear almost pinnatifidly toothed, teeth triangular, base hardly dilated flowers solitary, anther 4 celled *Kunth Enum* iii 112, *Nees Gen Fl Germ* iii. t x, *in Linnæa*, ix t 7, and x t 1, *Boiss Fl Orient* v 27 N fucoides *Griff Notul* iii 184, *Ic Pl Asiat* t 251, f 1 N muricata, *Del Fl Egypt* 281 N spinosa, *Ham in Wall Cat* 5182

Throughout India, in fresh and brackish water, ascending to 8000 ft in Western Tibet. CEYLON —DISTRIB Europe Asia Africa

Stem terete, branched *Leaves* ½-1½ in, teeth 4-8 on each side dorsally spinous, sheath with rounded entire sides *Flowers* diœcious, invol of male oblong 2 3-toothed *Carpel* oblong st gmas 2-3 filiform *Achene* $\frac{1}{12}$-⅙ in

2 **N. graminea,** *Del Fl Egypt* 282, t 50, f 3, leaves narrowly [illegible] y many toothed, basal auricles [illegible], flowers fascicled monœcious, [illegible] *Fl Orient* v 28, *A Braun* [illegible] N seminuda, *Griff Notul* iii [illegible] N semispipula *Balb Fl Ticin* [illegible] *eron* iii 49 Fluvialis indica,

Throughout INDIA in still fresh water and CEYLON —DISTRIB the Old World generally

Stem 1-2 ft *Leaves* ¾ 1 in, usually whorled, broader more transparent and more acutely toothed than is *N minor*

3 **N. minor,** *All Fl Pedem* ii 221, leaves very narrowly linear remotely toothed basal auricles rounded or truncate toothed rarely acute [illegible] *Kunth Enum* iii [illegible] N dichotoma, [illegible] iii 183, *Griff* [illegible] Caulinia indica, [illegible] dica, *Wall Cat* 5183, *in part*

Throughout INDIA and CEYLON in still sweet water —DISTRIB Old World generally

Stem very slender much branched *Leaves* spreading or the upper recurved, ½ in or less, hardly $\frac{1}{20}$ in broad green or brown when dry —There may be two or more species in India under the above name The other plant under Wallich's 5183 is a *Chara*

4 **N. falciculata,** *A Braun in Seem Journ Bot* ii (1864) 278 f 4, stem rigid leaves as in *N minor*, but auricles falcately incurved entire or the inner margin entire the outer toothed

MADRAS, at Tuticoreen, *Wight* —DISTRIB Philippine Islands

I greatly doubt this being distinct from *N minor*, amongst numerous specimens of which I find some with basal auricles very like those figured by Braun as *falciculata*

4. RUPPIA, *Linn*

Submerged slender branched brackish-water plants *Leaves* elongate,

tropical

R. rostellata, *Koch in Reichb Ic Crit* ii 66, fig 306, *Ic Fl Germ* vii t 25, peduncle straight after flowering, achenes obliquely ovoid acutely beaked *Boiss Fl Orient* v 20 R maritima, *Griff Notul* iii 196, *Ic Pl Asiat* t 257-259

THROUGHOUT INDIA and in CEYLON, in brackish water —DISTRIB Europe temp and trop Asia

Stem 2 ft and upwards *Leaves* 1–3 in *Fruiting peduncle* 1–6 in *Achenes* $\frac{1}{12}$ in long

5 ZANNICHELLIA, *Linn*

Submerged salt-water ... *Leaves* linear, sheaths stipular ... heaths, a ... male and fem in one me ... –3-celled anther, filament slender ... *Carpels* 2-9 sessile, style long slender, stigma oblique peltate crenate, ovule solitary, pendulous, orthotropous *Achenes* 4, sessile or stipitate, reniform, crested *Seed* pendulous, testa thin, embryo subcylindric, cotyledonary end twice folded on itself —Species 4–5, or forms of one

Z. palustris, *Linn Sp Pl* 969, *subsp* PEDICELLATA, male peduncle ... ubercled, style as long as ... *Aschers Fl Brandenb* ... t 34 f 2 Z pedun ... t 760 Z gibberosa, ... vii t 21, 22 Z pedi ... iii 190, *Ic Pl Asiat* t 256, 260

6 NAIAS, *Linn*

Submerged plants, stem branched filiform smooth or muricate *Leaves* opposite alternate or whorled, linear, entire or toothed *Flowers* minute, axillary, monœcious or diœcious MALE FL *Perianth* an outer tubular or inflated entire or 4-fid tube and a hyaline inner *Stamen* 1, adnate

to the inner perianth apiculate or cuspidate, 1–4 celled *Fem perianth* 0, or hyaline and adherent to the carpel *Carpel* 1, sessile, 1 ovuled, stigmas 2–4, slender, ovule basilar, erect, anatropous *Achene* oblong *Seed* erect, testa very thin, embryo straight —Species about 10, temperate and tropical

The Indian species of this genus require a very close examination, which I regret to say I have not materials in flower and fruit sufficient to enable me to undertake

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Throughout India, in fresh and brackish water, ascending to 8000 ft in Western Tibet CEYLON —DISTRIB Europe, Asia, Africa

Stem terete, branched *Leaves* ½–1½ in, teeth 4–8 on each side, dorsally spinous, sheath with rounded entire sides *Flowers* diœcious, invol of male oblong 2-3-toothed *Carpel* oblong stigmas 2–3, filiform *Achene* $\frac{1}{12}$–$\frac{1}{8}$ in

2 **N. graminea,** *Del Fl Egypt* 282, t 50, f 3, leaves narrowly linear or subulate acuminate flaccid acutely many toothed, basal auricles erect lanceolate toothed on both margins, flowers fascicled monœcious, anthers 4 celled *Kunth Enum* iii 115, *Boiss Fl Orient* v 28, *A Braun in Seem Journ Bot* ii (1864) 278 f 5. N seminuda, *Griff Notul* iii 184, *Ic Pl Asiat* t. 251, f 2, and t 253, 254 N semistipula *Balb Fl Tirin* t 15 Caulinia alzanensis, *Pollin Fl Veron* iii 49 Fluvialis indica, *Pers ex Wall Cat* 5183 B

Throughout INDIA in still fresh water, and CEYLON —DISTRIB the Old World generally

Stem 1–2 ft. *Leaves* ⅔ 1 in, usually whorled, broader, more transparent and more acutely toothed than is *N minor*

3 **N. minor,** *All Fl Pedem* ii 221, leaves very narrowly linear remotely toothed basal auricles rounded or truncate toothed rarely acute ... *Kunth Enum* iii ... N dichotoma, ... iii 183, *Griff* ... Caulinia indica, ... dica, *Wall Cat* 5183, *in part*

Throughout INDIA and CEYLON in still sweet water —DISTRIB Old World generally

Stem very slender much branched *Leaves* spreading, or the upper recurved, ½ in or less, hardly $\frac{1}{20}$ in broad, green or brown when dry —There may be two or more species in India under the above name The other plant under Wallich's 5183 is a *Chara*

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MADRAS, at Tuticoreen, *Wight* —DISTRIB Philippine Islands

I greatly doubt this being distinct from *N minor*, amongst numerous specimens of which I find some with basal auricles very like those figured by Braun as *falciculata*

1 **E. setaceum,** *Linn Sp Pl* 87, receptacle conical villous, fl. bracts cymbiform acute coriaceous glabrous black, seeds dark brown. *Kunth Enum* iii 550 *Steud Syn Pl Cyp* ii 270, *Thw Enum* 341. E intermedium, *Kœrn in Linnæa*, xxvii 601—*Rheede Hort Mal* xii t. 63

MALABAR, at Quilon, *Wight* CEYLON, *Walker*, &c

Stem 2 3 ft, stout or slender, flexuous *Leaves* 1½–2 in, flexuous, 1-nerved. *Peduncles* very many, slender, 1½–3 in, sheath ¾–1 in, tip membranous *Heads* ⅛ in diam *Male petals* obscure, stamens 6, fem sepals cymbiform, glabrous or nearly so, petals narrow, ciliate, with or without a gland *Seeds* oblong quite smooth

2 **E. capillus-naiadis,** *Hook f*, receptacle conical or convex villous, fl bracts whitish membranous outer glabrous inner with long white dorsal hairs, seeds dark olive green or black E setaceum, *Wall Cat* n 6077 *Mart in Wall Pl As Rar* iii 29, *Kœrn in Linnæa*, xxvii (*excl syn Linn*)

BENGAL, Serampore, *Griffith*, Vicrampore, *Clarke* KHASIA HILLS, at Nonkreem, *J D H & T T* BURMA, Tavoy and Pegu, *Wallich*, &c The CONCAN, *Stocks*—DISTRIB Cochin China

Closely resembles *E setaceum* in habit, foliage, &c. In the Burmese and Khasian specimens the fem petals are ciliate with long hairs in the Concan and Cochin Chinese they are nearly glabrous

3 **E. bifistulosum,** *Van Heurck Obs Bot* 105, receptacle conical glabrous, fl bracts dark all with short dorsal bristles, seeds chesnut brown E setaceum, *Benth Fl Austral* vii 191

KHASIA HILLS, at Myrung, alt 5000 ft *Griffith*—DISTRIB W Africa, Australia

B Terrestrial or marsh plants, stem rarely elongate

* Petals of male fl 3, one much the largest and protruded beyond the floral bracts, rarely subequal and all protruded *Invol bracts* globose in all, floral bearded

† Heads more than ½ in diam Receptacle villous

4 **E. robustum,** *Steud Syn Pl Cyp* 271 subcaulescent, scape subsolitary very stout, invol bracts ovate oblong or lanceolate acuminate pale shining, sepals and petals villously bearded, fem fl subsessile *Kœrn in Linnæa* xxvii 674 S bracteosum, *Steud l c* 272

NILGHIRI HILLS, alt 6000 ft, *Wight*, &c

Footstock often as thick as the thumb *Leaves* 1–3 by ⅓–½ in, narrowed to the obtuse or rounded tip, soft, thin, opaque, very many nerved striate, often shining *Scape* 8 in–3 ft, as thick as a crow quill or less *Heads* ½–⅔ in diam; invol bracts many seriate scarious, receptacle convex, villous, fl bracts narrowly lanceolate, acuminate *Flowers* 3 merous, sepals of both sexes 3, concave villous, stamens 6, fem fl with the ovary and petals stipitate above the sepals, stipes villous.—Much the stoutest Indian species

5 **E. caulescens,** *Hook. f & Thoms Herb Ind Or.*, caulescent, scape subsolitary from the stem or its branches, invol bracts oblong outer

obtuse inner acute black shining fem fl subsessile, sepals and petals villously bearded E atratum, β major, *Thw Enum* 341

CEYLON, *Wight*, *G Thomson*, central province, alt 5 7000 ft, *Thwaites* (No 131)

Stem simple, in young plants 3–4 in long and as thick as the thumb, often copiously branched in old, branches 6–10 in long leafy throughout *Leaves* 2–6 by 1/6–1/4 in, narrowed from the base to the obtuse tip, rigid, quite opaque, nerves very many, close, obscure *Scape* stout or slender *Heads* 1/4–1/3 in, invol bracts sub 3 seriate scarious, receptacle flat, villous, fl bracts oblanceolate, acute, dark, shortly bearded 2 sepals of fem fl concave, the 3rd flat petals very unequal, glands large, ovary with petals stipitate, stipes villous —The only Indian much-branched species

†† Heads 1/3 in diam or less

§ *Receptacle villous*

6 **E. subcaulescens,** *Hook f* stem short stout densely leafy, leaves linear acute concave thick opaque scapes 2–3, bracts all yellowish, involucral broadly obovate scarious floral cuneately oblanceolate acute bearded, fem fl sessile, petals oblanceolate villous, ovary with petals sessile

pedicelled, petals
E cristatum, var

CEYLON *Thwaites* (C P 1062 in *Herb Kew*, 789 in *Thw Enum*)

Rootstock as thick as a swan s quill *Leaves* 2 2½ in, narrowed from the base to the tip many nerved obscurely striate, sheaths obscurely woolly at the base *Scapes* 18–20 in, weak, flexuous *Heads* ¼ in diam the black cusps of the fl bracts contrasting with the white small petals, receptacle hemispheric, male fl on slender pedicels sepals 3 free tips bearded, stamens 6, fem petals very unequal, longer than the sepals, glands large —I have seen only one specimen of this well-marked species

pedicelled, sepals and petals softly hairy, ovary subsessile

INDIA, *Huegel* N CANARA, Tinai Ghat, alt 2000 ft, in streams and pools, *Talbot*

Stem very short *Leaves* 6–15 by $\frac{1}{8}$–$\frac{1}{6}$ in, exactly linear, opaque 7–11-nerved, nerves very slender *Scape* shorter or longer than the leaves, sheath 2–2$\frac{1}{2}$ in, tip obtuse membranous *Heads* $\frac{1}{3}$ in. diam, black and white, rather few-fld, receptacle convex, glabrous, invol. bracts green, much shorter than the floral, male sepals densely bearded, petals villous, one much largest, stamens 6, fem sepals short oblong concave, tips truncate bearded, petals subequal, glands large *Seeds* very minute, subglobose, pale yellowish, shining —Male petals and stamens sometimes sessile between the sepals, the conical stipes being very short or 0

** Petals of male fl subequal, or one rather larger, often very obscure, none produced beyond the floral bracts

† Involucral bracts woolly or hairy (sometimes glabrous in *E Brownianum*) Receptacle villous in all

17 **E. Wightianum,** *Mart in Wall Pl As Rar* iii 28, *Cat* 6067, tall, stout, leaves broadly linear or ensiform, tips obtuse, heads globose [illegible] icate or rounded, [illegible] us, male petals [illegible] bearded, petals [illegible] sessile *Kunth* [illegible] *innæa*, xxvii 658 (excl. syn) E sexangulare, *Herb Heyne*

TENASSERIM, *Wallich*, &c PEGU *Kurz* The CONCAN, *Stocks*, &c CEYLON, ascending to 7000 ft (C P 378, 3382)

Rootstock often as thick as the thumb *Leaves* 4–10 by $\frac{1}{4}$ in (and scapes), [illegible]

papillose —Fem fl sometimes 4 merous

18 **E Brownianum,** *Mart in Wall Pl As Rar* iii 25, t 248, *Cat* 6066, tall, slender, leaves narrowly linear or ensiform acuminate glabrous or hairy, scapes solitary very tall, heads $\frac{1}{2}$ in diam globose or hemispheric snow white, invol bracts obovate oblong or cuneiform rigid spreading at length reflexed, outer floral cuneiform inner spathulate obtuse, male petals small, fem fl. pedicelled, petals narrow villous with very long straight hairs, ovary subsessile *Kunth Enum* iii 562, *Steud Syn Pl Cyp* 271, *Kœrn in Linnæa* xxvii 663 E nilagirense, *Steud l c*, *Kœrn l c* 661

KHASIA HILLS, alt. 4–6000 ft, common MUNNIPORE, *Watt* NILGHIRI HILLS, *Wight*, *Gardner* CEYLON, *Gardner*, ascending to 7000 ft, *Thwaites* (C P 377, 1001)

Rootstock stout. *Leaves* 6–18 by $\frac{1}{12}$–$\frac{1}{4}$ in, many nerved, and scapes glabrous pubescent or copiously hairy *Scape* 1–2 ft, ribbed and deeply grooved, sheath very long, tip acuminate green *Heads* sometimes depressed and concave beneath, the stiff pale or dark invol bracts $\frac{1}{4}$–$\frac{1}{3}$ in long equalling the flowers, receptacle flat or convex; male sepals free or connate, tips bearded petals subequal, fem sepals cymbiform, dorsally hirsute, acute or cuspidate *Seeds* oblong or subglobose, papillose and striate —The hairs of the fem petals are much longest in the Khasian plant

19 **E. sericans,** *Mart in Wall Pl As Rar* iii 29, *Cat* 6079,
snow-
ounded,
sepals
oblan-
Kunth
Wall

BURMA, at Prome and Tavoy, *Wallich*

Rootstock small *Leaves* ½–1 in erect and recurved, 3–5 nerved, opaque *Scapes* 4 grooved, sheath short, tip acuminate green *Heads* very pale, invol bracts shining, pubescent, receptacle small hemispheric, flowers pedicelled, male sepals 3, narrow, free or 2 connate bearded, petals unequal, fem petals unequal, glands 0 *Seeds* globosely oblong papillose —I have no doubt as to the specific identity of *sericans* with *gracile* Kœrnicke unites the former with *Wightianum*, it is certainly very close, but the heads are much smaller, the male petals larger and fem broader The ovary with petals is sessile in *gracile* very shortly stipitate in *sericans* The specimens are very few

20 **E. lanceolatum,** *Miq in Pl Met exsicc* n 131, leaves narrowly oblong lanceolate many nerved translucent scapes many slender, sheath inflated above tip green heads globose ¼ in diam snow white, invol bracts small pale quadrate or obovate scarious not reflexed, male petals obscure, fem fl sessile, sepals 2 deeply cymbiform 3rd flat all bearded, petals very unequal oblanceolate ciliate, ovary with petals sessile *Steud Syn Pl Cyp* 271, *Kœrn in Linnæa*, xxvii 656

The CONCAN and CANARA, *Met Stocks*

Rootstock small *Leaves* 1–2½ by ⅛–⅙ in, acute or acuminate, flaccid, hardly sheathing *Scapes* 4–6 in, not deeply grooved sheath very slender below, inflated above the middle, tip acuminate *Heads* very like those of *E sericans*, as are the bracts and seeds — One of the fem sepals is sometimes winged at the back

†† Involucral and floral bracts both glabrous or nearly so

§ *Receptacle glabrous or sparsely hairy*

21 **E. Sieboldianum,** *Sieb & Zucc ex Steud Syn Pl Cyp* 272, leaves short subulate or setaceous, scapes very many, heads small globose

Bomb Fl 279, *Wall Cat* 6073 E setaceum, *Herb Heyne* E nitidum and tenue, *Herb Ham*

THROUGHOUT INDIA, from Kashmir to Assam and Burma, and southward to CEYLON (C P 795) —DISTRIB China, Japan, Mt Philipp

Annual *Leaves* 2–4 in, 3–5-nerved, rarely $\frac{1}{10}$ in broad, opaque or translucent *Scapes* slender, sheath short *Heads* ⅛ in diam, pale whitish or purplish, invol bracts spreading or ascending, much shorter than the head, receptacle columnar, glabrous or sparsely hairy, fl. bracts imbricating upwards, closely appressed, often with a broad purplish central band, male sepals 3, petals minute, stamens 1–6; fem fl with a long stipes above the sepals which is jointed between the sepals and ovary *Seeds* minute, red brown, quite smooth —Closely allied to Australian E

cinereum, Br, which has a villous receptacle As ascertained by Trimen (Linn Soc xxiv 136) from the examination of Hermann's Herbarium, the E sexangulare of Linnæus is E Wallichianum of Martius In Herb. Linn E sexangulare bears its right name, where there is also a specimen of E Sieboldianum, from Kœnig unnamed

22. **E. Duthiei,** *Hook f*, leaves very short broadly subulate, scapes many very slender, heads ¼ in diam broadly ovate or hemispheric, invol bracts spreading oblong obtuse scarious shining passing into the dark linear-oblong or oblanceolate acuminate glabrous glistening floral, fem fl shortly pedicelled, sepals 2 very narrow, petals 3 filiform

gli
tips
mal
with the petals stipitate Seeds broadly ob ong, ...

23 **E. alpestre,** *Hook f & Thoms Herb Ind Or*, leaves broad or narrowly subulate, scapes very many *short stout, heads broadly obcon* ... bracts ... as long as the flowers cuneiform coriaceous ... orm obtu ... apical ...

SIKKIM HIMALAYA, alt. 8–12 000 ft., and KHASIA HILLS, alt 5–6000 ft., *J D H* ... *Clarke* —DISTRIB W China, Japan

... to the acute ... r than the leave ... and black, flor ... pals 3, truncat ... tly clawed, ovar ... smooth —An ur

24 **E. truncatum,** *Ham ex Mart in Wall Pl As Rar* iii 2...

... yn) E cinere...

ASSAM, BENGAL, BURMA, and southward to MALACCA and CEYLON (C P. ...

Leucocephala spathacea, of which he had a good drawing made.

VAR *malaccense*; floral bracts broader flowers of both sexes sessile, ... broader and more coriaceous, gland apical ovary with petals stipitate, seeds lar... Malacca, *Griffith* (*Kew Distrib* 5567), at Kwala Pehang, *Ridley* —Possi... different species

§§ *Receptacle more or less villous*

25 **E. oryzetorum,** *Mart in Wall Pl As Rar* iii 28, *Wall Cat* 6069, leaves ensiform, scapes many short or tall, heads yellow globose or ovoid, bracts all scarious hyaline invol oblong obtuse passing into the cuneate-obovate cuspidate densely imbricate floral, fem fl shortly pedicelled, petals slender *Kunth Enum* iii 552, *Steud Syn Pl Cyp* 270, *Kœrn in Linnæa*, xxvii 639 E. Hamiltonianum, *Mart l c* 29, *Wall. Cat* 6075, *Kunth l c*

TROPICAL HIMALAYA, from Kumaon to Sikkim, ASSAM SILHET, PEGU, CHOTA NAGPORE SINGAPORE and PENANG

Rootstock short, stout, or 0 *Leaves* 1–3 by $\frac{1}{6}$–$\frac{1}{4}$ in spongy very many-nerved, narrowed to a truncate coriaceous tip *Scapes* 8–18 in (shorter in dwarf states), soft, flexuous *Heads* $\frac{1}{4}$–$\frac{1}{3}$ in diam, straw colrd, base intruded, receptacle conical or columnar, densely villous, male sepals 2, tips fimbriate or glabrous, petals minute or 0, stamens 6, fem fl pedicelled sepals 3 slender, caducous, petals filiform to oblanceolate, naked or ciliolate caducous, ovary with petals stipitate above the sepals *Seeds* pale yellow very minute, smooth —*E Hamiltonianum* is certainly an immature state of *oryzetorum*

26 **E. stellulatum,** *Kœrn in Linnæa* xxvii, 620, leaves membranous broadly subulate or linear, scapes many hairy, heads globose, bracts all many times longer than the flowers white scarious stellately spreading and finely acuminate involucral ovate lanceolate, floral narrowly lanceolate, fem fl sessile, petals oblanceolate ciliate with long hairs, ovary with petals sessile

The CONCAN, *Hugel Stocks* ? BENGAL (*Herb Kew*)

Leaves 1–2 in by $\frac{1}{4}$–$\frac{1}{2}$ in broad at the base tapering to a point, very many-

[illegible]

...bulate-lanceolate, floral many times longer than the dimerous subsessile flowers, ovary with petals stipitate *Kunth Enum* iii 568, *Steud Syn* [illegible]

[illegible] Tonkin, China

[illegible] *Scapes* rather stout, 1–5 in, diam, straw colrd, invol. bracts [illegible] longer narrowed at the base, [illegible] petals minute, deformed, stamens [illegible] crenately winged below the

[illegible] **E. minutum,** *Hook f*, very small, leaves subulate or filiform [illegible] or obtuse, scapes very many, sheaths membranous and inflated above, [illegible] lanceolate [illegible] fl subses- [illegible] or 0, ovary

[illegible] The CONCAN, *Law* MYSORE, *Sir F Adams* RAJPUTANA, on Mt Aboo, *Stocks*, [illegible]

Densely tufted *Leaves* $\frac{1}{2}$–$\frac{2}{3}$ in, compressed opaque, 3–5 nerved, base dilated and sparsely woolly within *Scapes* $1\frac{1}{2}$–$2\frac{1}{2}$ in, capillary, flexuous, sheath short *Heads* $\frac{1}{10}$ in diam, shining, invol bracts much longer than the floral, which are , male calyx is 3–4, fem ps, glabrous, bracts very
different

††† Involucral bracts glabrous, floral bearded villous or pubescent

§ *Receptacle glabrous or sparsely hairy*

29 **E. sexangulare,** *Linn Sp Pl* 87, tall, stout, leaves long, scapes many tall heads conoid or hemispheric hard hoary base truncate, invol bracts coriaceous subquadrate or orbicular, floral persistent densely petals short filiform sessile E Wallichi 6068, *Kunth Enum* 49, *Steud Syn Cyp* *Dalz & Gibs Bomb* quadrangulare, *Lour* *Fl Cochinch* 77

TENASSERIM southward to MALACCA and the DECCAN PENINSULA, from CANARA southwards CEYLON *Macrae*, &c (C P 220)—DISTRIB Tropical Asia, Madagascar

Rootstock as thick as the little finger or less *Leaves* 4–12 in, $\frac{1}{4}$–$\frac{3}{4}$ in broad at the base, flat narrowed up to the acuminate or subacute tip many-nerved, opaque, striate drying brown *Scapes* up to 18 in, stiff, tips of sheaths acuminate, not membranous *Heads* $\frac{1}{3}$ in diam or less invol bracts shining, horizontal rigid, appressed floral dark r gid, with white tips, receptacle globose columnar or hemispheric sparsely shortly pilose, flowers flat, male sepals free or connate, one sometimes dorsally winged, petals minute, fem sepals 3, 2 cymbiform incurved acute dorsally crenately winged or not 3rd linear, narrow *Seeds* subglobose or oblong the ridges papillose —In some Concan specimens from Dalzell the leaves are $\frac{1}{6}$–$\frac{1}{4}$ in broad linear flaccid, quite translucent, and the heads very small The Australian *E australe* Br hardly differs

VAR *longifolium*, more slender, leaves often longer, fem fl dimerous, petals sparsely hairy from the middle upwards E longifolium *Nees in Herb Willd ex Kunth l c* 567, *Steud l c*, *Kœrn l c* 690 E sexangulare, *Willd Herb* — Tenasserim, Malacca, the Andaman Islands and Ceylon

30 **E. Dalzellii,** *Kœrn in Linnæa* xxvii 605, rhizome elongate, leaves very slender finely acuminate, scapes many, heads hemispheric white villous, invol bracts scarious obovate hyaline oblanceolate subacute, fem fl petals 3 narrowly oblanceolate ciliate petals stipitate E rivulare, *Dalz in* *Dalz & Gibs Bomb Fl* 280

SOUTH CONCAN;

Rootstock elongate

Leaves in a terminal t

Scapes 7–18 in, 10 gr

bracts short, yellowish, receptacle hemispheric or columnar, sparsely hairy; fl. bracts incurved, hairs caducous; male sepals free or connate, tips villous petals small elliptic subequal; stamens 6 *Seeds* globose, smooth shining —Some flowerless very

long leaved specimens have a leafy stem 2–3 in long, as in Sect A, but much stouter. *E. fluviatile*, Trim (see end of genus) is probably allied

31 **E. cuspidatum,** *Dalz in Hook Kew Journ* iii (1851) 281, leaves short linear ensiform flaccid 7–9 nerved translucent, margins thickened, tip rounded and cuspidate, scapes several very long, heads globose or hemispheric white villous invol bracts cuneiform or rounded, scarious, floral membranous cuneate obovate, fem fl sessile, sepals 3, 2 deeply cymbiform dorsally tubercled, ovary with petals sessile *Dalz & Gibs Bomb Fl* 280

–10 in, soft, membranous the hyaline floral, receptacle convex, quite naked, male sepals 2, narrow, free, petals small, subequal, fimbriate, stamens 6, fem sepals coriaceous, petals 3, very narrow, fimbriately villous towards the tip *Seeds* oblong, quite smooth

6072 E

TEMPERATE HIMALAYA, from Garwhal, alt 5–6000 ft, to Sikkim, alt 4–5000 ft The KHASIA HILLS, alt 4–6000 ft

Rootstock small *Leaves* 2–3 by 1/8–1/4 in. usually subulate and narrowed from the base to the acute tip but often broader flaccid linear and obtuse or rounded at the tip, opaque or translucent, many nerved *Scapes* 4–9 in, soft, sheaths with

cymbiform 3rd flat, tips villous with stout hairs, petals spathulately oblanceolate densely villous, ovary with petals sessile

KHASIA HILLS, alt 5–6000 ft on rocks in streams *Griffith*, &c

Roots of capillary fibres *Leaves* 1–1½ by 1/16 in *Scapes* slender, often flexuous, deeply 4 or 5 grooved, sheaths with membranous tips *Heads* ⅛ in diam, white above the black involucre, receptacle columnar, glabrous, male sepals 3, free or connate, petals minute, obovate, subequal, villous, stamens 2–6, fem petals with large black glands *Seeds* broadly oblong, yellow —Allied to *E mitophyllum* and *miserum*, but the male petals are small and equal

34 **E. Pumilio,** *Hook f.*, leaves very short subulate acuminate, scape few short slender, sheath pale green not striate subinflated tip rounded, head 1/10 in diam few fld hairy, invol bracts 3–4 erect obovate

or cuneately oblong tips rounded, floral cuneately oblanceolate subacute, fem fl sessile, sepals 2 oblong concave tips ciliate flat, petals oblanceolate ciliate, ovary with petals sessile

WESTERN HIMALAYA, Kumaon, 3–4000 ft and Garwhal, alt 8–9000 ft, *Duthie*

Leaves ¼–½ in, spongy, opaque, green *Scapes* 1–1½ in, obscurely 4-grooved, sheath as long as the leaves tip membranous *Heads* subglobose, invol bracts scarious, glistening, pale or dark floral dark, sprinkled with white hairs, receptacle small conical glabrous, male sepals free, tips ciliate, petals very minute, stamens 6 *Seeds* oblong, pale, with papillose ridges —Near *E achiton*, but the receptacle is quite glabrous

§§ *Receptacle villous*

35 **E. luzulæfolium,** *Mart in Wall Pl As Rar* iii 28, *Cat* 6071, leaves short broadly subulate many nerved, scapes many flexuous,

Throughout INDIA, from Bengal to Burma and the Concan, ascending the Khasia Hills to 6000 ft, commc

Rootstock elongate and as ... isely fibrous *Leaves* 1–3 by $\frac{1}{15}$–$\frac{1}{8}$ in narrow ... rarely translucent *Scapes* 3–12 in slend ... pale, invol bracts coriaceously scarious, ... conical or columnar, male sepals 2–3, tips ciliate, petals minute, obscure, pedicel of fem fl slender *Seeds* oblong yellow —Difficult to distinguish at sight from *E trilobum* and *quinquangulare*

E. ... *quangulare*, L ... Sp Pl 87 leaves linear ensiform

E argyræum, *Steud l c* 271 E erythropodum, *Miq in Hohen Herb Canara*, n 131 Sphærochloa quadrangularis, *Beauv ex Desv in Ann Sc Nat Sc* xiii 47. Leucocephala graminifolia, *Roxb, Fl Ind* iii 612

Throughout INDIA, from the Upper Gangetic plain to BURMA, and southward to CEYLON (C P 702)

Leaves 1–4 by ¼–½ in; usually narrowed from the base to the acuminate tip.

trilobum It is said to be Australian, but I have seen no specimen from that country

37 **E. trilobum,** *Ham in Wall Cat* n. 6072 D, leaves broadly subulate or ensiform acute or acuminate many nerved, scapes many, heads

quinquelobum, *Wall Cat l c*, *Kœrn in Linnæa*, xxvii 645 E subulatum, *Bojer ex Kœrn l c* E Sollyanum, *Royle Ill* 409, t 97, f 1

Throughout INDIA, from Kumaon, ascending to 4000 ft, to Bengal, the Concan and Malabar

Habit of *E quinquangulare* from which it is often difficult to distinguish forms but the heads are usually smaller much darker in colour, the invol bracts are narrow, the floral never acuminate or cuspidate, and the flowers are very shortly, if at all pedicelled, with broader concave fem sepals that are strongly ciliate on the back *Ovary* sessile or very shortly stipitate —Mr Law has sent specimens of a

quinquangulare

TENASSERIM, *Helfer* (*Kew Dist* 5584)

Leaves 3–4 by ⅙–⅓ in, translucent *Scapes* 4–9 in, flexuous, young glabrous or

ading hairs

als sessile

ery slender

Heads ⅛–¼ in diam or less; invol bracts pale, scarious, floral white, membranous

40 **E. Thwaitesii,** *Kœrn in Linnæa*, xxvii. (1854), 627, leaves linear subulate or ensiform acuminate many nerved, scapes many twi

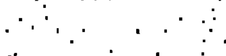
head hemispheric dark sparsely mealy, involucre as broad as

bracts spread ...

ovary with petals sessile

NILGHIRI HILLS, *Schmidt*. CEYLON, *Walker, Thwaites* (C P 790, *in part*)

Leaves 1-2½ by $\frac{1}{16}$-¼ in, few- or many nerved, opaque. *Scapes* flexuous, tips of



41. **E. collinum,** *Hook. f.*, leaves short narrowly linear or subulate, scapes many, heads globose dark grey, invol bracts small, outer very short cuneate obovate, floral oblanceolate or spathulate acute acuminate or cuspidate dorsally hoary or the outer glabrous, male petals 3 small one often largest and exserted beyond the sepals but not beyond the bracts, fem fl pedicelled, sepals 2 cymbiform 3rd flat, petals narrowly oblanceolate ciliate, ovary and petals sessile or shortly stipitate. E luzulæfolium, *Thw Enum* 341.

NILGHIRI HILLS, *Foulkes, Schmidt. Gardner*, Conoor, 7000 ft, *Clarke*. CEYLON, Newera Ellia, *Gardner, &c*, alt 4000 ft (C P 796, 1000)

Densely tufted. *Leaves* 1-2½ by $\frac{1}{12}$-$\frac{1}{8}$ in, obtuse compressed, 1-9 nerved, opaque or translucent. *Scapes* 1½-12 in, rigid flexuous, sheath stout, equalling or shorter than the leaves, tip obtuse membranous. *Heads* ¼ in diam. invol bracts scarious, at length reflexed, receptacle hemispheric or columnar, densely villous, sepals of male and fem dark.—The well developed male petals distinguish this species from the others of this section except *E Walkeri*, in which they are subequal.—In Wight's Herbarium there are specimens (without habitat) of this or a closely allied plant, smaller in size in which the male petals are equal.

42. **E. achiton,** *Kœrn in Linnæa*, xxvii (1854), 630, small, leaves ... y small hemispheric few fld, invol ... ncate or rounded, floral obovate ... shortly pedicelled, sepals 2 slender,

KHASIA HILLS, alt 4-5000 ft, *Griffith* (*Kew Distrib* 5376) *Clarke*.

Leaves ½-1 in, flattened, opaque, 3-5 nerved at the base. *Scapes* few, filiform,

NEPAL, *Wallich* BENGAL, SILHET, the KHASIA HILLS, and TENASSERIM, *Griffith*, &c The CONCAN, *Stocks* CHOTA NAGPORE, *Clarke* —DISTRIB trop Afr

Tufted, annual *Leaves* ¾–1¼ in, many-nerved, often recurved *Scapes* striate, hardly grooved, sheath tumid, tips membranous *Heads* ⅙–¼ in diam, invol bracts scarious, stellately spreading pale, shining, often lacerate, receptacle convex villous, flowers subsessile, male sepals 3, free (or 2 connate), petals minute or obsolete, fem sepals rarely 3 the third capillary *Seeds* much narrower than in most other species, linear-oblong, papillose all over, pale yellow.

IMPERFECTLY KNOWN SPECIES

E fluviatile, *Trim in Journ Bot* xxiii (1885), 270, rootstock very

CEYLON, Western province, in rapid stream, *Trimen*

Submerged except the head, rootstock flexuous, roots copious, long *Leaves* 8–10 by about $\frac{1}{24}$ in, solid, compressed, chanelled, flaccid, sheath dilated, cottony within *Scape* rather shorter than the leaves, sheath not dilated tip acute *Head* ⅛ in diam (receptacle?) —Descr from Trimen The only specimen seen by me is in a very young state, with the flowers not available for analysis Compare E *Dalzellii*

E CEYLANICUM, *Kœrn in Linnæa*, xxvii 667, a foot high stem very short, leaves 2–3½ in tufted linear suddenly mucronate, scapes solitary 1 in, heads rather large cylindric globose woolly white ⅟ in long, invol bracts obovate at length

Ceylon, *Herb Berlin* —Evidently near *E atratum*, but leaves mucronate

E EURYPEPLON, *Kœrn l c* 685, 2–3 in high, leaves 3 in. tufted broadly linear narrowed upwards tip obtuse membranous, scapes crowded 4-winged 1½–3 in, heads subglobose 1½–2½ in broad powdery pubescent and nigro-niveous, invol bracts rigid powdery pubescent olive-black much shorter than the heads, floral rhombic-cuneate olive black rigid closely imbricate hiding the fl, receptacle hairy — *Ind Or*

E HETEROLEPIS, *Steud Syn Pl Cyp* 271, *Kœrn l c* 572, tufted, stem very short, leaves lanceolate from a broad base subobtuse, hardly 1 in long —Bombay, *Roux*

Cyp 268, (*Herb* *uncatum*,

E NEESIANUM, *Kœrn l c* 628 —Ceylon (*Herb Berol*) —Is likened to *truncatum* and *achiton* by its dimerous sepals, but the receptacle is shortly villous Very like *E viride* in the head, differs in the form and number of the perianth segments and the obtuse floral bracts, *Kœrn*

ORDER CLXXII CYPERACEÆ By C B Clarke, F.R S

Grass- or rush-like herbs *Stems* solid *Leaves* 3 ranked, rarely 0, shea
the
disp
Star

Fertile glume ovate, keel smooth green subexcurrent, sides 3–4 striate, straw colrd *Stamens* usually 2 *Nut* ⅔ length of glume, ellipsoid, obtuse

2 **K. cylindrica,** *Nees in Wight Contrib* 91, *partly*, nearly glabrous, rhizome very short, stem not thickened at base, spikes 3–1 subcylindric straw colrd, nut yellow brown ultimately black *Boeck in Linnæa*, xxxv 415 —Kyllingia, *Wall Cat* 3442, *partly*, 3443 D, *partly*

Scattered widely in INDIA, not plentiful anywhere TROPICAL HIMALAYA,

3 **K. melanosperma,** *Nees in Wight Contrib* 91, glabrous, rhizome thick very short, stem elongate leaves short head solitary ovoid, nut

Linnæa, xxxv 419 K

K fuscescens, *Boeck l c*

Verz Ind Archip ii 63,

Cat 3440

NILGHERRIES, *Leschenault*, &c CEYLON, *Thwaites*, &c SINGAPORE, *Kurz* — DISTRIB Java S Africa, Madagasc

Rhizome about 1 in *Stems* -0 in, sharply triquetrous at top *Leaves* often 4 by ¼ in always much shorter than stem *Spike* ⅔ by ¼ in thicker than in *K cylindrica*, bracts up to 2–4 in, leaf like *Spikelets* ⅛ in long usually with 1 rarely 2 nuts *Fl glume* ovate, acute, keel green scarcely scabrous, sides 3–4 striate fuscous *Stamens* often 3 *Nut* ⅔ length of glume, oblong-obovoid

4 **K. brevifolia,** *Rottb Descr et Ic* 13, t 4 fig 3, glabrous, rhizome creeping elongate, leaves long or short, spikes 3–1 ovoid fl glume submucronate eglandular, keel upwards not winged, nut ultimately yellow-

hw Enum 345, *Boeck in*

219 K cruciata, *Nees in*

Japon 35, *Miq in Ann*

rna, *Kunth Enum* ii 131,

, *Kunth l c* 134, *Miq l c*

Hohenackeri, *Boeck l c*

of Rottb) Schœnus colo-

Kyllingia, *Wall Cat* 3143,

partly

Throughout INDIA, from the Panjab to Assam, CEYLON, and MALACCA —

curved) *Leaves*

Head ⅙–⅓ in diam,

ly cylindric, bracts

Fl gl ovate, keel

lose scabrous, upper

2 *Nut* ⅔ or ¼ the

** *Nut bearing glume winged in upper half of keel*

5 **K. monocephala,** *Rottb Descr et Ic* 13, t 4 fig 4, nearly glabrous, rhizome creeping elongate, spikes 1–3 ovoid, fl glume submucronate

upper half of keel with a lunate crested glandular wing, nut yellow brown *Roxb Fl Ind* i 180 *Nees in Wight Contrib* 91 *(partly)*, *Miq Fl Ind Bat* iii 291, *Thw Enum* 345, *Boeck in Linnæa*, xxxv 427 K triceps, *Linn f Suppl* 104 *(partly not of Rottb)* K sororia, *Miq Fl Ind Bat* iii 293 *(partly, not of Kunth)* K gracilis *Zoll Verz Ind Archip* ii 63 *(not of Kunth)* K mindorensis, *Steud Syn Pl Cyp* 67 Scirpus Cephalotes, *Jacq Hort Vind* t 97—Kyllingia, *Wall Cat* 3443 A, F *(partly)*, H *(partly)*.

Throughout INDIA, common, from Kumaon to Assam, CEYLON and SINGAPORE —DISTRIB Hot and warm temp regions of the Old World except the Mediterranean

Closely resembles *K brevifolia* excep in the crest (usually straw colrd with scattered red circular resinous glands) on the upper part of keel of nut bearing glume

6 **K. squamulata,** *Vahl Enum* ii 381, nearly glabrous, roots fibrous, spikes 1–3 ovoid fl glume scarcely acute its keel winged by a broad hyaline incise toothed crest nut brown *Boeck in Linnæa*, xxxv 431 K Metzii, *Steud Syn Pl Cyp* 70 K monocephala, *Strachey Herb Kumaon*, 74 *(not of Rottb)*

Western India, KASHMIR *Thomson* GURWHAL, up to 5500 ft, *Duthie* MT ABOO, *King* CANARA, *Met* —DISTRIB Trop Africa

Stems tufted (annual), 2 12 in *Leaves* often longer than stem, ⅛ in broad *Head* ½ in in diam, green or brown *Spikelets* ⅛ in long, maturing 1 nut only

2 PYCREUS, *Beauv*

Characters of 4 *Cyperus* but nut compressed laterally, and style branches 2 —Species 50, all warm and temp regions

1 **P. flavescens,** *Nees in Linnæa*, ix 283, annual, slender, umbel simple or reduced to 1 head, bracts spreading, spikelets linear $\frac{1}{10}$ in wide yellow or pale, nut obovoid compressed shining black hardly half as long as the glume Cyperus flavescens, *Linn Sp Pl* 68 *(not of Linn Herb)*, *Kunth Enum* ii 5, *Reichb Ic Fl Germ* viii 31, t 278, figs 662–664, *Boeck in Linnæa*, xxxv 438, *and in Journ Linn Soc* xviii 104, *Clarke*, *l c* xxi 36, *Boiss Fl Orient* v 364 *(excl Cabul sp)*

PUNJAB, …
Stems 1–1 …
clustered or …
white lines, …

2 **P. stramineus,** *C B Clarke*, umbels reduced to 1 compound head of 5–12 straw colrd spikelets, bracts and spikelets (even in fruit) … Cyperus stramineus, *Nees in* … , *Clarke in Journ Linn Soc* … *Syn Pl Cyp* 4 *(not of Kœnig)* … v 480 *(not of Spreng)* C fili…

Fertile glume ovate, keel smooth green subexcurrent, s des 3–4 striate, straw colrd *Stamens* usually 2 *Nut* ⅔ length of glume, ellipsoid, obtuse

2 **K. cylindrica,** *Nees in Wight Contrib* 91, *partly*, nearly glabrous, rhizome very short, stem not thickened at base spikes 3–1 subcylindric straw colrd, nut yellow brown ultimately black *Boeck in Linnæa*, xxxv 415—Kyllingia *Wall Cat* 3442, *partly*, 3443 D, *partly*

Scattered widely in INDIA, not plentiful anywhere TROPICAL HIMALAYA,

3 **K. melanosperma,** *Nees in Wight Contrib* 91, glabrous, rhizome thick very short, stem elongate, leaves short, head solitary ovoid, nut ultimately black *Thw Enum* 345, *Boeck in Linnæa*, xxxv 419 K brevifolia *Nees l c* 91 (*partly not of Rottb*) K fuscescens, *Boeck l c* 421, *partly* K vaginata (and *var* major) *Zoll Verz Ind Archip* ii 63, *Miq Fl Ind Bat* iii 290—Kyllinga, sp *Wall Cat* 3440

NILGHERRIES, *Leschenault*, &c CEYLON, *Thwaites*, &c SINGAPORE, *Kur* — DISTRIB Java, S Africa, Madagasc

Rhizome about 1 in *Stems* 20 in, sharply triquetrous at top *Leaves* often 4 by ¼ in, always much shorter than stem *Spike* ⅔ by ¼ in thicker than in *K cylindrica*, bracts up to 2–4 in, leaf like *Spikelets* ⅛ in long usually with 1 rarely 2 nuts *Fl glume* ovate, acute, keel green scarcely scabrous sides 3–4 striate fuscous *Stamens* often 3 *Nut* ⅔ length of glume, oblong obovoid

4 **K. brevifolia,** *Rottb Descr et Ic* 13, t 4 fig 3, glabrous rhizome creeping elongate, leaves long or short, spikes 3–1 ovoid, fl glume sub- ed, nut ultimately yellow- *hw Enum* 345, *Boeck in* 219 K cruciata, *Nees in* 35, *Miq in Ann th Enum* ii 131, *c* 134, *Miq l c* ckeri, *Boeck l c* Schœnus colo- *Wall Cat* 3443, *partly*

Throughout INDIA, from the Panjab to Assam, CEYLON, and MALACCA — DISTRIB All warm regions except the Mediterranean

Rhizome 4–12 in *Stems* 4–24 in. (or sometimes ½ 2 in curved) *Leaves* $\frac{1}{10}$ ⅛ in broad, longer than the stems or very much shorter *Head* ⅙–⅓ in diam, green or brownish, spikes often 1, if 3, median ovoid scarcely cylindric; bracts 3–4, up to 4 in *Spikelets* ⅙–⅛ in, usually with 1 nut only *Fl gl* ovate, keel green 3 nerved slightly excurrent or recurved, lower half setulose scabrous, upper smooth or sparsely setulose, sides 3–4-striate *Stamens* 3 or 2 *Nut* ⅔ or ½ the length of glume, ellipsoid, obtuse, style as long as half the nut

** *Nut bearing glume winged in upper half of keel*

5 **K. monocephala,** *Rottb Descr et Ic* 13, t 4 fig 4, nearly glabrous, rhizome creeping elongate, spikes 1–3 ovoid, fl glume submucronate

9 **P. ferrugineus,** *C B Clarke*, spikelets rather broader ..., glumes more distant (otherwise as *P polystachyus*, Var β) Cyperus ferrugineus, *Poir in Lam Encyc* vii 261, *Kunth Enum* ii 11, *Bel... F Maurit* 408 C polystachyus, Vars ferruginea and macrostachya, *B... in Linnæa* xxxv 479, Vars ferruginea, micans and filicina, *C B Clarke in Journ Linn Soc* xxi 54, 55 C strictus, *Rottler ms Heyne ms ... Roxb*)—*Wall Cat* 3331

The DECCAN PENINSULA, *Rottler, G Thomson* CHITTAGONG, *J L L...* DISTRIB. Afric Americ

10 **P. sulcinux,** *C B Clarke* as *P polystachyus*, var β, but spikelets longer, glumes more remote nut unsymmetric its faces much ... pressed usually concave Cyperus sulcinux, *C B Clarke in Journ Linn Soc* xxi 56 and xxv 80

BENGAL, up to 5000 feet, alt. frequent ANAMALLAY MTS; *Beddome* ... *Kurz* TENASSERIM, *Helfer* (*Kew Distrib* n 6203 4)—DISTRIB. As... Malaya.

Slender *Spikelets* up to 40–50 fld Narrow edge of *nut* much flattened ... the rhacheola

††† *Robust spikelets larger, yellow brown or red, leaves close ... stem*

11 **P. angulatus,** *Nees in Linnæa* ix 283, robust, ... spikelets yellow or brown yellow (see also var β) spicate nut ... void ¼–⅓ ... *in Journ* ... *Kunth E* ... *Wight C* ...

NEPAL *Wallich* DINAJPORE *C B Clarke* KHASIA, alt ... § *T T*, &c NILGHIRI HILLS, *Wight* AVA *Wallich*—DISTRIB ...

Glabrous *Rhizome* long 1/12 in in diam, or often 0 ... 1½–3 ... long ... in, ... incor ... loose ... margin crisped *Stamens* 3, anthers oblong linear *Nut* com... small, branches linear shortly exsert

Var β *Wightii*, umbel contracted into a subcompound ... shining chestnut brown

Deccan Peninsula, *Wight*—A remarkable plant, only ... spikelets are, in size and colour, unlike any Indian or other ... while they most closely resemble *P macranthus*, a Cape ... the surface cells subquadrate, while in *P macranthus* ... oblong

12 **P puncticulatus,** *Nees in Linnæa* ix 2..., ... simple, spikelets red spicate nut broad ellipsoid ... glume P Bacchu, *Nees in Linnæa*, ix 283 ... *Vahl Enum* ii 348, *Kunth Enum* ii 15, ... 283 *Thw Enum* 342 *Boeck in Linnæa* xxxv ... *C B Clarke in Journ Linn Soc* xxi 68 C Bacch... inundatus, *Nees in Wight Contrib* 76 (not of ...

Fl Ind i 203, chiefly C flavidus *Herb Heyne*, *Wall Cat* 3336, A C tegetum, *Herb Wight*, *Wall Cat* 3355, B

The DECCAN PENINSULA, *Rottler*, *Wight*, &c CEYLON, *Thwaites* —DISTRIB China

Glabrous, annual *Stem* erect at base, subsolitary 1–2 ft *Leaves* often as long as stem, ¼ in broad *Spikelets* ¾ by ⅙ in 7–30 fld., sides very parallel

Var β *quinquagintiflorus*, C B Clarke, l c 69, spikelets elongate up to 50 fld, anthers apiculate Cyperus macrostachyus, *Vahl Enum* ii 349 (*as to plant of Rottler, not of Lam or Poir*) C longus, *Herb Heyne*, *Wall Cat* 3336 B — Madras, *Heyne*

Bras ii part 1 9, ruddy brown, glumes nut obovoid greatly compressed nearly as long as glume Cyperus Hochstetteri *Nees ms*, *Krauss in Flora*, xxviii 755 (*in note*), *Boeck in Linnæa*, xxxv 471, *C B Clarke in Journ Linn Soc* xxi 69 C flavicomus, *Torrey Bot Mexic Bound* 226, *Benth Fl Austral* vii 261 (*excl syn*, *not of Michx*)

CONCAN and MALABAR, *G Thomson*, &c RANGOON, *R Scott*, *Kurz* — DISTRIB Tropics

Glabrous annual *Stem* erect at base subsolitary, 1 3 ft *Leaves* often ⅔ length of stem, ⅓ in broad *Umbel* rays sometimes 11, up to 7 in long sometimes 2–3, only 1 in long *Spikelets* often large 1 by ⅙ in

INDETERMINABLE SPECIES

C KAMPHŒVENERI, *Boeck Cyp Novæ*, i (1888) 5, rhizome tuberous, style but little exserted shortly 2 fid —NICOBAR ISLDS, *Kamphœvener*

3 JUNCELLUS.

Stem erect simple, leafy only near base *Inflorescence* umbellate or

This genus is *Cyperi Sect Juncellus* of Kunth and differs from *Cyperus* by having a 2 fid style and more or less compressed, not equilaterally trigonous nut Several of the species have been considered by Boeckeler and others as forms with 2 branched styles of corresponding species of *Cyperus*

* *Inflorescence umbelled*

1 **J. serotinus,** *C B Clarke*, stoloniferous stout, stem at top

t 1, fig 2

KASHMIR, alt 1000 ft, *Jacquemont* &c PUNJAB, alt 1000 ft, *Thomson*, &c —DISTRIB from Spain to Japan

Glabrous, except sometimes rhachis of spikes *Stems* sol tary, 1–3 ft *Leaves* often as long as stem, ¼–½ in broad *Bracts* 3–5 up to 8–18 in leaf like *Umbel* rays 3–6, up to 2–6 in long very unequal rather stout, umbellules shortly corymbose or capitate, bracteoles short *Spikes* of 5 10 spikelets *Spikelets* ⅓–½ by $\frac{1}{?}$ –⅓ in, 12–
scarcely
exampl
branch
confus
has fur

2 **J. stylosus**, *C B Clarke*,
and bracts rather short glumes not
branches very long nut (not quite
Cyperus Monti var β? stylosa, C
73

KHASIA HILLS, *Griffith*

Leaves not half length of stem *Bracts* scarcely overtopping inflorescence *Rhachis* of spikes glabrous *Glumes* chestnut red with very narrow white margins inflated as in *J serotinus* *Spikelets* comose from the persistent long dark red styles *Nuts* perhaps all imperfect

3 **J. inundatus**,
leaves and bracts long
obtuse 5–7-nerved nut
Roxb Fl Ind i 201, *Wall Cat* ... C B Clarke in Journ Linn Soc xxi 31, 73 (*not of Br or Nees*) C diluvialis, *Schultes in Roem & Sch Syst* ii *Mant* 121 C puncticulatus *Steud Syn Cyp* 10 (*partly, not of Vahl*) —Cyperus, *Wall Cat* 3355, C 3359, I

BENGAL, in swamps from Sylhet to the sea frequent —DISTRIB China

Rhachis of spike glabrous, 1–2 in, spikelets often ⅛–$\frac{1}{6}$ in apart Differs little from *J serotinus* but by the open spikes In herbaria it is more frequently mixed either with *Cyperus procerus* or *Pycreus puncticulatus*

4 **J. alopecuroides**, *C B Clarke* large, leaves and bracts long,

Throughout India, from PESHAWUR, *Griffith* (*Kew Distrib* 6150) to SILHET, *Hook f & T T*, and CEYLON, *Thwaites* —DISTRIB Afric and Austral trop

A large glabrous annual 2–3 ft *Leaves* often as long as stem ⅓–½ in broad Rays of *umbel* 4–6 in, bracts 12 18 in, leaf like, raylets often 1 in bearing at apex 2–4 ebracteolate spikes *Spikes* 1–1½ by ¾ in *Spikelets* ¼ in, lanceolate, compressed *Glumes* muticous or mucronulate *Stamens* 3, anthers muticous *Nuts* plano-convex, finally ashy black (many imperfect pale), style as long as nut, branches longer, shortly exsert —United by Boeckeler with

Cyperus exaltatus, Retz, but separated by the very crowded spikes and 2 fid style

** *Stem with one head of spikelets*

5 **J. pygmæus,** *C B Clarke*, annual, leaves and bracts long green

Gaz x (1878), 3-0 C squarrosus, *Roxb Fl Ind* i 190 C monocephalus, *Roxb mss (not Fl Ind)* Dichostylis pygmæa *Nees in Linnæa*, ix 289 Pycreus diffusus and pygmæus *Nees in Linnæa* ix 283—Isolepis? *Wall Cat* 3495

From KASH
Glabrous
ing *Head* ¼–
finally pale bro
linear oblong,
nut, branches
Scirpus Michelianus, Linn, so that the synonymy cannot be completely ex

6 **J. lævigatus,** *C B Clarke*, rhizome creeping, leaves short or long lower bract as though continuing stem, head lateral, spikelets 1–30 linear 16–40 fld somewhat turgid glumes close packed obtuse, nut ½–⅗ length of glume Cyperus lævigatus, *Linn Mant* 179, *Rottb Descr*

ms C mucronatus
Pycreus lævigatus *Nees in Linnæa*, x 130 P mucronatus and lateralis, *Nees l c* x 283

Throughout WESTERN INDIA from the Punjab, *Aitchison*, and Bundelkund *Delhi* to SOUTH MADRAS, *Wight*—DISTRIB most warm climates

Glabrous *Rhizome* usually woody, ⅙ in in diam internodes very short densely covered by chestnut or red scales, when floating sometimes 3–6 ft with long internodes *Stems* 4 24 in *Leaves* sometimes as long as stem, ⅛ in broad usually short, occasionally obsolete (i.e sheaths terminated by a lanceolate process not green) *Spikelets* closely clustered, ¼–½ in, rigid, often curved straw-colrd or tinged with chestnut or chestnut red, rhacheola stout tetragonous hardly winged *Glumes* concave ovate, 7–11 nerved *Stamens* 3, anthers yellow with a small

linear-lanceolate red scabrous crest *Style* slender, hardly as long as nut, branches shortly exsert *Nut* plano or concavo-convex, top obtuse

Var β *junciformis*, rigid, spikelets 1–6 rigid shining chestnut or black. C distachyos, *All Fl Pedem Auctuar* 48, t 2, fig 5, *Boiss Fl Orient* v 367 C junciformis, *Desfont Fl Atlant* i 42, t 7, fig 1, *Boiss l c* C levigatus, var junciformis, *C B Clarke in Journ Linn Soc* xxi 79
Peshawur, *Stewart* Sind, *Stocks* —DISTRIB Oriental

4 CYPERUS, *Linn*

Stem erect, simple, leafy only near base *Inflorescence* umbellate or capitate *Spikelets* linear or oblong, compressed, rhacheola persistent. *Glumes* distichous, 2 lowest empty, 1–∞ succeeding bisexual seriatim de- [illegible] anther [illegible] plano- [illegible] nut, [illegible] *ferus*,

Subgenus I ANOSPORUM (Genus), *Nees in Linnæa* ix 287 *Style* long, undivided or obscurely 3–2 toothed. Hydroschoenus, *Moritzi Verz Zoll. Pfl* 95. Trentepohlia, *Boeck in Bot Zeit* xvi 249 —(Sp 1)

1 **C. Cephalotes**, *Vahl Enum* ii 311 leaves and bracts long, infl of one compound dense head, nut stipitate below corky *Kunth Enum* ii 48, *Miq Fl Ind Bat* iii 271, *C B Clarke in Journ Linn Soc* xxi. 25, 34, t 1, figs 1–6 C monocephalus, *Roxb Fl Ind* i 188 C Hookerianus, *Thw Enum* 342 (*not of Arn*) C leucocephalus, *Wight ms* (*not of Retz*) C natans, *Ham ms* C dubius, *Rottler in Neue Schr Gesell Freunde Berlin*, iv 193 *in Obs* Anosporum monocephalum *Nees in Linnæa*, ix 287, *and in Wight Contrib* 92 *Griff Notul* iii 103, *Boeck in Linnæa*, xxxvi 411 [illegible]
Hydroschoen[illegible]
95, *Miq l c* [illegible]
Ungeria mo[illegible]
Rheede Hort [illegible]

From BENGAL to MADRAS and BURMA —DISTRIB China Malaya, Austral
Glabrous, floating in tanks, stolons slender *Stems* 4–16 in *Leaves* 2–5, as long as ⅓ stem, ⅙ in broad *Bracts* 3–5 up to 4–8 in, leaf-like *Heads* ½–¾ in diam *Spikelets* 10-70, ¼ ½ by ⅛ in, compressed, rigid, often bent, 10–36-fld ; [illegible]

tank

Subgenus II PYCNOSTACHYS. *Inflorescence* umbellate throughout or capitate, spikelets digitate or clustered, not spicate *Style branches* linear, rarely linear-lanceolate (Sp 2–26)

Sect 1. *Natantes* *Style*-branches linear lanceolate *Nut* corky below. —Tank floaters (Sp 2)

2 **C. platystylis,** *Br Prodr* 214, leaves and bracts long umbel compound, spikes near together often very numerous *C B Clarke in Journ Linn Soc* xxi 27, 117, t 1, figs 7–9 (*excl syn C caducus*) C pallidus, *Heyne ms*, *Nees in Linnæa*, ix 284, *and in Wight Contrib* 79, *Kunth Enum* ii 40, *Thw Enum* 343 C canescens, *Herb Heyne*, and C fluitans, *Herb Ham*, *Wall Cat* 3337, 3359 D (*partly*) Anosporum pallidum, *Boeck in Linnæa*, xxxvi 412

From BENGAL and BURMA to CEYLON and PENANG —DISTRIB Malaya, Austral

Glabrous, floating in tanks *Stolons* covered by ovate acute striate pale brown scales *Stems* solitary, 6–42 in *Leaves* often as long as stem, up to 1/3 1/2 in broad coarse, cutting, nerves many, strong *Umbel* 1 10 in diam, bracts 8–18 in, leaf like, somewhat corymbose *Spikelets* 5–1300, 1–6-together digitate, 1/2 by 1/8 in, 20–40 fld, brown pale or reddish, rhachilla persistent, scarcely winged *Glumes*

nerves *Stamens* 3, filaments
ll linear lanceolate red mucro
pale brown, corky cells of the
deciduous, branches as long as

style

Sect 2 *Amabiles* Slender annuals *Umbel* very rarely reduced to a single head *Spikelets* small *Glumes* mucronate (Sp 3–5)

3 **C. amabilis,** *Vahl Enum* ii 318, spikelets linear, golden brown, glumes truncate mucro short erect, stamen 1, nut obovoid 3/5 length of glume *Kunth Enum* ii 108, *C B Clarke in Journ Linn Soc* xx 283, and xxi p 85 C aureus, *H B K Nov Gen et Sp* i 205, *Kunth l c* 21 *Boeck in Linnæa*, xxxv 494

KUMAON, *King* MORADABAD, *Thomson* CHOTA NAGPORE, up to 2000 ft, *C B Clarke* —DISTRIB Warm regions

Glabrous *Stems* cæspitose, 2–8 in *Leaves* 1/3–1/2 length of stem, 1/12 in broad, weak *Umbel* often very compound rays 4 in long, sometimes reduced to 1 head

leaf like *Spikelets* 3–10 in a
lumes boat-shaped back
Anthers small, oblong

4 **C. castaneus,** *Willd Sp Pl* i 278, small, umbel rarely compound, spikelets linear
recurved, stamens 2–1
excluded) *Roxb Fl In*
ii 21, *Thw Enum* 343
C B Clarke in Journ
Ceylon Pl 100 C pusillus, *Herb Wight*, *Wall Cat* 3323

From EAST NEPAL, *J D Hooker*, to CEYLON, *Thwaites*, and PERAK, *King* —DISTRIB Tonkin, Austral

Glabrous *Stems* 3/4–6 in *Leaves* as long as stem, 1/12 in broad or (usually) shorter *Umbel* rays 0–2 in rarely again divided, sometimes reduced to a single head, bracts often as long as inflorescence *Spikelets* 3 20 in a cluster, black-chestnut in type form, 1/4–1/3 by 1/12 in, 15–70 fld *Glumes* boat-shaped, back 3 nerved, keel excurrent greenish-yellow *Anthers* small, short oblong *Nut* red black, sides exactly parallel, style much shorter than nut; branches small, linear

5 **C. cuspidatus,** *H B & K Nov Gen et Sp* i 204, glumes strongly 3-nerved, mucro conspicuous recurved, nut oblong obovoid 1/3

length of glume (mucro excluded) otherwise as *C castaneus* *Kunth Enum* ii 22, *Boeck in Linnæa*, xxxv 496, *C B Clarke in Journ Linn Soc* xx. 284, and xxi 88, and xxv 80, *Trimen Cat Pl Ceylon*, 100 C angustifolius, *Ham ms*, *Wall Cat* 3376 (*mainly*), *Nees in Wight Contrib* 79, *Kunth Enum* ii 21 C castaneus, *Hance in Journ Linn Soc* xiii 130, *Miq Fl Ind Bat* iii 261 ('forma Sundaica) C solutus, *Steud Syn Cyp* 14, *Miq Fl Ind Bat* iii 263

Throughout INDIA, from KASHMIR and ASSAM to CEYLON and PENANG —

is a very common plant, *C castaneus* a rare one

Sect 3 *Difformes* Small or middle sized, annuals or biennials, rhizome 0, or in *C Haspan* creeping Leaves and bracts moderately long, narrow, weak *Inflorescence* umbellate sometimes reduced to a single head *Spikelets* small, numerous *Glumes* scarcely cuspidate (Sp 6–11)

C. fuscus, L

KASHMIR and N W HIMALAYA alt 6000 ft, *Thomson*, &c —DISTRIB Westward to Britain

Glabrous *Stems* cæspitose, 2–16 in, weak. *Leaves* longer or shorter than stem, $\frac{1}{8}$–$\frac{1}{6}$ in broad grass like *Rays of umbel* often 1–1$\frac{1}{2}$ in, sometimes much longer, bracts usually exceeding inflorescence *Spikes* $\frac{1}{3}$–$\frac{1}{2}$ in in diam *Spikelets* 5–15, $\frac{1}{4}$–$\frac{1}{3}$ by $\frac{1}{15}$ in, 16–36 fld often reddish *Glumes* boat-shaped, ovate, scarcely mucronate *Stamens* usually 2, anthers oblong, obtuse *Nut* equally or unequally triquetrous, pale brown *Style* much shorter than nut, deciduous, branches linear

7 C.

compo

dense

long

Nees

282,

344,

370,

Steud

(*mainly*)

8 **C. silletensis,** *Nees in* ... slender, stolons 0, umbel contr... dense, spikelets small linear m... obovoid $\frac{1}{3}$–$\frac{2}{5}$ length of glume ... 555, *C B Clarke in Journ* ... 3363 F, 3536 (partly)

BENGAL, ASSAM, SIKKIM, and BURMA.

Stems 4–12 in, rather slender at top, flowering the first year, but often producing short lateral shoots from the base of stem *Spikes* pale brown. *Glumes* at top subtriangular Otherwise resembling *C difformis* —Seldom collected, but not rare

9 **C. pulcherrimus,** *Willd ex Kunth Enum* ii 35, middle sized ...

Cyperus *Wall Cat* 3357

SIND, *Pinwill.* BENGAL, *Wallich* ASSAM, *Griffith*, &c CEYLON, *Thwaites* PENANG, *Curtis*, n 1954.—DISTRIB Java, Borneo

Very near *C silletensis*, dried examples are easily distinguished by the crisped incurved top of glume Spikelets very like those of *C flavidus*, which is a slender species

10 **C. Haspan,** *Linn Sp Pl* 66 (*partly*), middle sized or small, pale or red not yellow, rhizome long creeping but plant often flowering in first year, spikelets 2–6 digitate small linear, stamens 3–2, nut small ovoid or obovoid $\frac{1}{3}$–$\frac{1}{2}$ length of obtuse glume *Roxb Fl Ind* i 210, *Nees in Wight Contrib* 80 (*partly*), *Kunth Enum* ii 34, *Dalz & Gibs Bomb Fl* 282, *Thw Enum* 343, *Boeck in Linnæa*, xxxv 574, var *a* partly, and var *β*, ... C graminifolius, ... pes avium, *Bertol* ... *rb Heyne*, *Wall Cat* ..., D, E F, 33?? —Scirpus, *Rottb Descr et Ic* 58, t 17, fig 3 (*excl Syn Linn*)

Throughout INDIA, abundant, especially in dibbled rice fields —DISTRIB All warm regions

Glabrous *Rhizome* in typical form creeping, 6 in and upwards, covered by ovate triangular scales and with distant solitary stems, but stems often cæspitose on a very short rhizome or with fibrous roots only *Stems* 4–30 in, sometimes stout, almost 3 winged at top sometimes slender trigonous *Leaves* short or longer and overtop... straggling ... and far ove...

11 **C. flavidus,** *Retz Obs* v 13, slender, annual, ripe yellow or

finally blackening, stamen 1 (rarely 2) nut plano convex (plane face against rhachilla), ripe marble-white (otherwise as *C Haspan*) *Roxb Fl Ind* i 200, *Nees in Wight Contrib* 80 in note, *Dalz & Gibs Bomb Fl* 283, *C B Clarke in Journ Linn Soc* xx 287 and xxi 122 and xxv 81 C H[illegible]
(T[illegible]
m[illegible]
W[illegible]
C[illegible]

Throughout INDIA abundant in rice fields —DISTRIB Warm regions of the Old World

Lives about 3 months *Bracts* usually longer than stem *Glumes* rather smaller than in *C Haspan* *Nut* very obtuse at top

Sect 4 *Nivei* *Rhizome* woody very short rootlets wiry *Inflorescence* of one head (Sp 12–14)

12 **C. Teneriffæ,** *Poir in Lam Encyc* vii 245 stems at base cylindric thickened by coloured sheaths spikelets 10–36 fld much compressed red glumes very acute conspicuously mucronate nut $\frac{1}{3}$ length of glume C nitens *Rottb in Neue Schr Ges Freunde Berlin*, iv 193 *in Obs* (not of Retz) C coromandelinus *Spreng Syst* i 217 (*not of Boeck*) C pectiniformis *Roem et Sch Syst* II *Mant* 128 (*not of Nees*) C pectinatus *Roxb Fl Ind* i 190 (*not of Vahl*) C Wightii *Nees in Wight Contrib* 78, *Kunth Enum* ii 99 *Boeck in Linnæa* xxxv 507 C rubicundus *Kunth l c* 19 *Webb et Berth Phyt Canar* iii 361 t 240 (nut too acute) *C B Clarke in Journ Linn Soc* xxi 104 (*not of Vahl*) C arenarius *Herb Heyne Wall Cat* 3314 A (*partly*) C nitens *Herb Madras*, *Wall Cat* 3314 B

DECCAN PENINSULA *Rottler* *Wight* POONA *Woodrow* NILGHIRIS *Hohenacker* —DISTRIB Africa Arabia

Glabrous whole plant usually more or less red stolons 0 *Stems* 2–11 in *Leaves* usually $\frac{2}{3}$ length of stem $\frac{1}{8}$–$\frac{1}{6}$ in broad weak sheaths broad usually scarious inflated. *Bracts* 2 lower 1–1½ in *Spikelets* 3–20 in 1 head, $\frac{3}{8}$ by $\frac{1}{4}$ in *Glumes* close packed much imbricated at base 9 15 striate, keel very acute excurrent conspicuously *Stamens* 3 anthers nearly muticous *Nut* obovoid triquetrous with [illegible] long as nut branches linear — [illegible] the description can hardly (a[illegible] [illegible] as Vahl does not describe the [illegible]e our plant *C rubicundus* Vahl [illegible] he name *C nitens*, Rottler is [illegible] because almost the only certain thing regarding it is that it was not a *Pycreus*, and therefore not the *Cyperus nitens*, auctorum

13 **C. [illegible]**

From KASHMIR to UPPER BURMA, alt 0–6000 ft. and southward to Calcutta and Hyderabad —DISTRIB Cabul China

Glabrous *Rhizome* woody, almost wholly constructed of the nodose bases of

Throughout INDIA, except the dry west, common from SIKKIM and ASSAM to CEYLON and PENANG —DISTRIB All warm regions

Glabrous *Rhizome* very short; roots wiry *Stems* 8–30 in *Leaves* often as long as stem, ⅓–⅔ in broad, flat, green, 3-nerved *Umbel* 4–12 in in diam, decompound (depauperated examples with few spikes occur), bracts 4–10, up to 1 2 ft, leaf-like *Spikelets* 2

the commonest of the genus, ...æus's *elegans*, whose type, his , Aiton Nor can his descrip- ...g the name *C elegans*, Linn,

21 **C. pubisquama,** *Steud in Zoll Verz Ind Archip* ii 62 and *Syn*

C. B Clarke in Journ Linn Soc xxi 127 and xxv 81, *Trimen in Journ Bot* xxiii 140 (*not of Vahl or Roxb*) —Cyperus, *Wall Cat* 3370, B

FROM ASSAM and BURMA to PERAK and CEYLON —DISTRIB Malay Islds

Differs, uniformly, from large examples of *C diffusus*, Vahl in the tightly-packed glumes (even in fruit), but might be treated as a var

22 **C. Helferi,** *Boeck in Linnæa*, xxxviii 360, middle-sized, umbel middle sized flaccid, glumes distant ovate lanceolate shortly mucronate, nut ½ length of glume (otherwise as *C diffusus*) *C B Clarke in Journ Linn Soc* xxi 128 —Fimbristylis, *Wall Cat* 3528

BURMA Chappedong River, *Wallich* PEGU *Kurz* MERGUI, *Griffith* (*Kew Distrib* 6140) TENASSERIM or ANDAMANS, *Helfer* (*Kew Distrib* 6140)

23 **C. multispicatus**

striatus, *by error*)

CACHAR *Keenan* TENASSERIM or ANDAMANS *Helfer* (*Kew Distrib* 6163)

Umbel 12–16 in across, spikelets innumerable, in Helfer's specimen nearly all pedicelled solitary, in Keenan's about half solitary half 2–3 together digitate *Glumes* in fruit with upper margins imbricated

24 **C. Kurzii,** *C B Clarke in Journ Linn Soc* xxi 129, umbel very decompound secondary rays rigidly divaricate, spikelets 20–40 fld wings of rhachilla broad persistent, glumes closely imbricate tip triangular acute scarcely mucronate (otherwise as *C multispicatus*)

ANDAMAN ISLES, Phœnix, *Kurz*

This does not match any of the foregoing closely allied species (nn 20–24 inclusive)

25 **C. turgidulus,** *C B Clarke in Journ Linn Soc* i 130, stem at top triquetrous almost 3 winged, umbel dense secondary rays divaricate, spikelets few fld turgid sometimes almost terete clustered in small globose

heads (otherwise as *C diffusus*) Scirpus trialatus *Boeck in Linnæa*, xxxvi 721 —Isolepis, *Wall Cat* 3473

From PEGU to PENANG and MALACCA, frequent, *Helfer* (*Kew Distrib* 6164), &c.—DISTRIB S China

Stems 12–20 in *Umbels* 3–4 in in diam *Spikelets* usually about 6 fld

26 **C. radians** *Nees & Meyen ex Nees in Linnæa* ix 285 (name) and *in Nov Act Nat Cur* xix *Suppl* 1, 63 umbel simple or compound rays longer than stem, spikelets 1–30 clustered compressed or nearly

B (*partly*) Rynchospora *Wall Cat* 3427

MALAY PENINSULA TENASSERIM *Helfer* (*Kew Distrib* 6209) SINGAPORE, *Wallich* —DISTRIB China, Malaya

Leaves Rays ⅝–⅔ in clusters *ts* ⅓ by usually ley has

proved *C Griffithii* to be only a form of *C radians* This unmistakable species is not very closely allied to *C diffusus* but unless a section is made for it alone it is not clear where it can be better arranged than at the tail of the *Diffusi*

Subgen III CHORISTACHYS *Infl* umbellate, spikes often more or less corymbed spikelets (sometimes very shortly) spicate Style branches linear (Sp 27–61) [N B —There is no line of separation between this subgenus and II *Pycnostachys*

Series A Rhachilla of spikelets not much winged Leaves and bracts long (except in *C malaccensis*) (Sp 27 39)

Sect 1 *Compressi* Annuals, or sometimes flowering the second year (Sp 27–31)

Linnæa, xxxv 517, *C B Clarke in Journ Linn Soc* xx, 284 and xxi 97, *Boiss Fl Orient* v 372 (*not of Jacq*) C pectiniformis *Nees in Wight Contrib* 77 (*excl syn Roxb*) C Meyenii, *Nees et Meyen in Nov Act Nat Cur* xix *Suppl* 1 57 —C viridis, *Herb Roxb*, *Wall Cat* 3308

Throughout INDIA, from the Punjab and Assam to Ceylon and Singapore —DISTRIB All warm countries (except Australia)

94, *Miq Fl Ind Bat* III 286, *Boeck in Linnæa*, xxxv 597 *C B Clarke in Journ Linn Soc* xxi 143 (*excl syn and Madag*) C exaltatus, *Strachey Cat Pl Kumaon*, 74, *Duthie in E T Atkinson Gaz* x 620 (*not of Ret.*) C distans, β major, *Thw Enum* 432—Cyperus, n 54, *Herb Ind Or H f et T T*

From the PUNJAB to CACHAR and CEYLON

Usually 2–3½ ft *Umbel* primary rays often 8–12 in, spikes bowing on the ultimate rays *Spikelets* in ripe fruit collapsing in a tassel (not spreading at right angles as in *C distans*) rather broader than in *C distans* with less remote glumes —It is difficult to draw a line between this species and fine examples of *C distans*

34 **C eleusinoides,** *Kunth Enum* II 39, umbel large compound, spikelets densely spicate linear 20–40 fld, glumes not very remote often mucronulate, nut narrowly ellipsoid often curved ½–¾ length of glume *Miq Fl Ind Bat* III 270, *Boeck in Linnæa*, xxxv 596, *C B Clarke in Journ Linn Soc* xxi 142 and xxv 81, *Boiss Fl Orient* v 371 C xanthopus *Steud in Flora*, xxv 595 and *Syn Cyp* 36, *Thw Enum* 344 C infra apicalis, *Nees mss*, *Aitch Cat Punjab Pl* 155, and *in Journ Linn Soc* xix 189 C racemosus fastigiatus and mysurensis, *Herb Heyne*, *Wall Cat* 3346 C complanatus *Herb Wight*, *Wall Cat* 3347

35 **C. Thomsoni,** [illegible]
woody umbel dense large [illegible]
somewhat large spicate lin[illegible]
tic subacute nut oblong [illegible]
Journ Linn Soc xxi 1[illegible]
T T

SIKKIM TERAI, ASSAM CACHAR and BENGAL —DISTRIB Tonkin

Glabrous *Stems* 12–20 in, robust *Leaves* often as long as stem, ⅓–½ in broad strong *Umbel* (in Hooker n 263 ('type' of Boeckler) 4½ in in diam, but often much larger (primary rays up to 7 in), bracts exceeding umbel *Spikes* dense rhachis ½–¾ in, glabrous *Spikelets* 20–40 nearly 1 by ¼ in, moderately compressed, wings of rhacheola very narrow persistent *Glumes* with 7–9 very close dorsal nerves, sides nerveless *Stamens* 3, anthers linear oblong narrow, minutely tipped by red obtuse connective *Nut* trigonous black, top acutely pyramidal, style shorter than nut, branches linear, shortly exsert.

36 **C. malaccensis,** *Lam Ill* I 146, rhizome creeping culms [illegible] –12 fld, glumes very narrowly [illegible] *Linnæa*, xxxv [illegible] *Orient* v 373 [illegible] C gangeticus, [illegible] *Fl Ind* I [illegible] C Pangorei *Roxb l c* 202 C procerus, *Roxb l c* 203 (*partly* i.e. *at least tab cited*) C scoparius *Decne in Nouv Ann Mus* III 369, *Lindley in Forbes East Archip* 520 (*not Poir*) C Wallichii, *Nees in*

Wight Contrib 83 (*part of Wall n* 3312 *C with trifid style*) C spaniophyllus, *Steud Cyp* 21, *Miq Fl Ind Bat* iii 267 C tegetiformis, *Benth Fl Austral* vii 279 mostly (*not Roxb*) C Pangorei and Panimotha, *Herb Ham*, *Wall Cat* 3329, M N —*Rheede Hort Mal* xii 93, t. 50

On brackish mud banks, from BENGAL to SINGAPORE SIND, *Pinwill* — DISTRIB Asia, Austral, Polynes

Glabrous *Stolons* long $\frac{1}{8}$–$\frac{1}{4}$ in diam, clothed by broad lax black chestnut scales 1 in long hardening into woody creeping rhizomes *Stems 18–36* in, at top $\frac{1}{8}$ $\frac{1}{6}$ in in diam with 3 concave faces *Leaves* usually few topmost 2 6 in erect, green, sword-shaped shortly caudate *Umbel* 2–6 in in diam simple compound or congested, bracts 3–5 up to 6 by " in, lowest usually erect (till fruit-time) *Spikes* of 4–10 spikelets, rhachis glabrous *Spikelets* $\frac{1}{3}$–$\frac{1}{2}$ by $\frac{1}{20}$–$\frac{1}{16}$ in *Glumes* about $\frac{1}{14}$ in very concave in dry examples loosely imbricated *Stamens* 3, anthers linear oblong not crested *Nut* trigonous becoming black, style $\frac{1}{3}$ length of nut, branches lı
is more nearly allied to *C*
to rhachilla Easily recogr
being forced apart by tl e
Rottb Descr et Ic p 40, t 11 fig 3, is adduced here by various authors, but I do not see how it differs from *C polystachyus*, Rottb (which may be anything except *Pycreus polystachyus* Beauv)

37 **C. pilosus,** *Vahl Enum* ii 354 stolons slender, stems at top

Boeck in Linnæa xxxv 001 C *Wallichii Wight mss* (*not Nees*) —Cyperus, *Wall Cat* 3334, 3318, 3355 (*partly*)

Throughout INDIA, alt 0–5000 ft, abundant —DISTRIB Trop As, Afric, and Austral

Glabrous, except the rhachis of spikes. *Stolons* scarcely $\frac{1}{20}$ in diam, with distant nodes and scales $\frac{1}{4}$–$\frac{1}{2}$ in long, easily overlooked when young as roots, but

keeled, 3 7 nerved on back, ultimately loosely imbricated *Stamens* 3, anthers linear-oblong, muticous *Nut* acutely trigonous, black, style shorter than nut, branches linear, moderately exserted —Of all *Cypereæ* this has proved the most

dangerous to Cyperologists ...

pilose

Var β *obliqua*, C B Clarke l c 151, spikelets with fewer (sometimes only 5–6) flowers often pale and very far apart C obliquus, *Nees in Wight Contrib* 86, *Kunth Enum* ii 60, *Boeck in Linnæa*, xxxv 611, *W Wats in E T Atkinson Gaz* x 383 C quinqueflorus, *Hochst ms*, *Steud Syn Cyp* 37 (*partly*) —INDIA, widely scattered, but very much less common than the type — Java

Var γ *polyantha* C B Clarke l c, umbel rays 2½ in, secondary umbels corymbose, rhachis of spikes nearly glabrous, spikelets 1 in 40–45 fld chestnut red —Bengal, Mymensingh, *C B Clarke*

38 **C. Babakensis**, ...

few

com

more robust than those of C *pilosus*, glumes boat shaped hispid scabrous at the top of keel, nut hardly ½ glume (otherwise as *C pilosus*) *Boeck in Linnæa* xxxv 521 C Babakan, *Steud Syn Cyp* 6 (*wrongly placed in Pycreus*) C bengalensis and pilosus, var δ Babakensis, *C B Clarke in Journ Linn Soc* xxi 151 C Bacha, *Herb Ham*, *Wall Cat* 3336 E (*partly*).

EAST BENGAL, *Griffith* (*Kew Distrib* n 6207), Nathpur, *Wallich*, n 3336 E (*partly*), Mymensingh, *C B Clarke* —DISTRIB Java

Rays of umbel 3 6, lowest much longer than the others, erect, stout *Spikes* 2 by 1½ in very dense *Spikelets* ⅗ by ⅛–⅙ in, 14 10 fld, red brown, rhacheola stout

39 **C. procerus**, *Rottb Descr et Ic* 29, t 5, fig 3, stout glabrous (but see var β) secondary umbels loosely corymbed of 1–5 spikes, spikelets remote large 20–46 fld, glumes broad obtuse nut obovoid ½ length of glume (otherwise nearly as large *C pilosus*) *Nees in Wight Contrib* 83 ... *Rheede*) and *Kunth Enum* ii

... C Heynei *Boeck in Linnæa*, xxxv ... C carnosus and spadiceus, *Herb Heyne*, *Wall Cat* 3355, A

... 0–3000 ft

... ant larger
... high red
... ecause the
rhachis of spikes is glabrous From its red colour it has been confounded with *Pycreus puncticulatus*, Nees

Var β *lasiorrhachis*; axis of spikelets scabrous-pilose —Chota Nagpore, alt 2000 ft, *C B Clarke* —Perhaps the plant collected by V Ball in Chota Nagpore, cf *C B Clarke in Journ Linn Soc* xxi 151, in note

Series B Rhachilla of spikelets (usually conspicuously) winged (Sp 10–end)

Sect 3 *Bulbosi* Stolons slender soon disappearing, terminating in tunicated bulbils —Closely allied to *Mariscus* Sect *Bulbocaules* (Sp 40)

40 **C. bulbosus,** *Vahl Enum* ii 342, coat of bulbils striated black splitting into elliptic very acute segments leaves overtopping stem narrow flagellate, umbel contracted corymb form lowest ray somewhat distant (spikelets nearly as in (*rotundus*) *Nees in Wight Contrib* 80, *Dalz & Gibs Bomb Fl* 284 *Poecl in Linnæa*, xxxvi 300 *Trimen in Journ Bot* xiii (1834) 358 C jemenicus *Retz Obs* iv 11 (jeminicus), *Roxb Fl Ind* i 191, *C B Clarke in Journ Linn Soc* xxi 175 t 2, figs 17 18 (*var β excl*) and *in Journ Bot* xix 18 cum fig (*not of Rottb*) C geminatus, *Kœnig ms*, *Ainslie Mat Med Hind* (1813) 250 *Moon Cat Pl Ceylon* 6 (*not of Schrader*) C oleraceus *Roxb ms* C stoloniferus, *Nees in Wight Contrib* 81 (*partly not of Retz*) C hexastachyus β pendulus, *Nees in Wight Contrib* 82 (*partly*) C rotundus *Kunth Enum* ii 51 (*partly*), *Thw Enum* 313 (*partly*)—Cyperus *Wall Cat* 3317, A (*partly*)

SIND *Stocks* &c ALIGURH *Duthie* (n 7670) The DECCAN PENINSULA and CEYLON [illegible]

Glabrous [illegible] white, edible, ultim[illegible] *Leaves* numerous, sul[illegible] volute rays up to 2 [illegible] mbose, bracts overtopping inflorescence similar to leaves *Spikelets* 3 20 reddish up to $\frac{3}{4}$ by $\frac{1}{1}$ in 8–26 fld, wings of rhachilla ellipt c persistent *Glumes* boat shaped ovate obtuse 11 nerved *Stamens* 3 anthers linear muticous *Nut* obovoid obtuse triquetrous black hardly $\frac{1}{2}$ glume style shorter than nut branches linear, somewhat long —In the absence of roots this species can generally be discerned by the imperfection of the umbel i e lowest bract with its ray a little distant

Sect 4 *Brevifoliati* Tall Stolons long hardening into creeping rhizomes Leaves short rarely $\frac{1}{2}$ length of stem. Glumes approximate, closely imbricate (Sp 41–44)

41 **C. articulatus,** *Linn Sp Pl* 66 stem robust terete leaves

BENGAL to CEYLON —DISTRIB All warm regions

Glabrous *Stolons* $\frac{1}{5}$ $\frac{1}{4}$ in diam, clothed by ovate-lanceolate striate brown-black scales $\frac{3}{4}$ in long *Stems* 3–6 ft, often 2–4 in apart on the thick woody rhizome, at top $\frac{1}{8}$–$\frac{1}{4}$ in in diam terete or scarcely trigonous when dry usually with false nodes $\frac{1}{2}$ in apart, upper lanceolate colrd limb, rarely by a [illegible] 2 6 in, bracts [illegible] ovate [illegible] margins not reflex[illegible] *Spikelets* 5 50 fld, straw colrd, after [illegible] nerved on back, wings of rhachilla *Stamens* 3, anthers linear-oblong, l, black, style shorter than nut,

42 **C. tegetiformis,** *Roxb Hort Beng* 6, *and Ic ined* t 1321, leaves hardly any, stem trigonous at top often triquetrous not (or ob ... umbel) lowest ... ples (other ... *num* ii 56, ... *n Soc* xxi ... C benga ... *Sch Syst* ... (*largely*) — Cyperus sp n 40, *H f & T Th Herb Ind Or* (Chittagong example)

... very ... flated ... glumes, and by the apex of stem 3-winged

43 **C. corymbosus,** *Rottb Descr et Ic* 42, t 7, fig 4, stem at top ... or 0, bracts $\frac{1}{2}$–$\frac{3}{4}$ length of umbel ... ferruginous or reddish (otherwise ... *B Clarke in Journ Linn Soc* ... *Kunth Enum* ii 54, *Boeck in Linnæa* xxxvi 272 C Koenigii, *Vahl Enum* ii 302, *Kunth l c* C monophyllus *Vahl l c* ii 352 (*fide Nees*) C seminudus *Roxb Fl Ind* i 187, *Nees in Wight Contrib* 80, *Kunth l c* 55 (*not of* Moritz) C enodis *Boeck l c* 271 Papyrus Pangorei, *Nees l c* 88 (*partly*) — Fimbristylis, *Wall Cat* 3525 E

From Kumaon, *Wallich*, to Assam, Burma, Ceylon — Distrib As, Afric, and Amer

Stems 2–3 ft, when dry *often more or less transversely septate* Uppermost *leaf* in the type example of Retz nearly 6 in long *Bracts* leaf like green not ovate at base, keeled, with margins recurved in the dry state, in the type of *C diphylla* Retz, much overtopping the inflorescence

Var β *Pangorei*, C B Clarke, l c 293, 159, spikelets 1 in 18–36 fld C Pangorei, *Rottb l c* 31, t 7, fig 3, *Kunth l c* 57 C corymbosus *var* macrostachya, *Boeck l c* 277 (cf *Steud Syn Cyp* 31, *note* to *C* corymbosus) — Deccan Peninsula, *Wall Cat.* 3351 C, &c (Herb Kew) — Madagasc

44 **C. scariosus,** *Br Prodr* 216, stolons slender, stems long slender at top triquetrous umbel slender contracted spikelets linear pale straw colour (very like those of *C tegetiformis*) *C B Clarke in Journ Linn Soc* xxi 159 C pertenuis, *Roxb Fl Ind* i 198, *Nees in Wight Contrib* 83 C rotundus, *Thw Enum* 343 (*partly*), *Boeck ms* partly, not of *Linn*

Bengal, Soondreebun, *C B Clarke*, common Pegu, *Kurz ms*, 683, 684 (*Herb Calcutta*) — Distrib Australia.

... and umbel

Sect. 5 *Subimbricatæ* Tall Rhizome very short, woody, stolons 0, i e lateral shoots from base of stem immediately ascending Glumes

scarcely imbricate in fruit (in this differing from the *Brevefoliatæ* and *Rotundæ*). (Sp 45–47)

45 **C. macer,** *C B Clarke in Journ Linn Soc* xxi 160, stems long slender, leaves few short, umbel loose irregular slender spikelets linear 8–16 fld, glumes obtuse, nut obovoid ½–⅓ length of glume

On rocks in rivers PEGU, *Kurz*, n 671 CHITTAGONG, *C B Clarke* CENTRAL INDIA, *Duthie* n 9837

Glabrous *Stems* 2 3 ft, at top very slender triquetrous *Leaves* inconspicuous, uppermost 4–6 (rarely 8–10) in long, erect, narrow *Umbel* rays 3–6, slender, 2 4 in long, sometimes again divided, bracts ½–2 in, leaf like *Spikelets* ½ by

the present series altogether

46 **C. tegetum,** *Roxb Fl Ind* i 208, stem robust at top trigonous or triquetrous, leaves usually short or 0 (sometimes pretty long), umbel compound or decompound usually large, spikelets shortly spicate linear many-fld often coloured, wings of rhachilla strong caducous, glumes somewhat remote in fruit obliquely spreading nut oblong obovoid ½ length of glume *Wall Cat* 3332 A, 3352 *mainly* *C B Clarke in Journ Linn Soc* xxi 160 (*excl syn C Schimperianus and African plants*), and xxv 81 C corymbosus, *Kœnig ms Rottl in Neu Schr Gesell Freunde, Berlin* iv 219 *in Obs*, *Boeck in Linnæa* xxxvi 276 (*mostly*), *Duthie in E T Atkinson, Gaz* x 620 (*not of Rottb*) C dehiscens, *Nees in Linnæa*, ix 286, *Kunth Enum* ii 56 (*excl syn Roxb*), *Trimen Cat Pl Ceylon*, 100 C Pangorei (*i e* Pangorei) *Wight ms*, *Thw Enum* 344 (*not of Rottb*) C tegetiformis, *W Wats in T E Atkinson Gaz* x (1876) 393 (*not of Roxb*) C Pangorei & C subulatus, *Herb Heyne*, *Wall Cat* 3330 Papyrus dehiscens *Nees in Wight Contrib* 89 P Pangorei, *Nees l c* 88 (*mostly*) P corymbosus, *Nees l c* 89 (*excl syn Rottb*)

Throughout INDIA, alt 0–6000 ft, from KASHMIR to CEYLON and BURMA — DISTRIB Cult in Mauritius (*C textilis*, Bojer)

Glabrous *Rhizome* horizontal stout, woody *Stems* 3 ft *Leaves* uppermost usually 4–8 by ¼ in, often 0, occasionally 16 in *Umbel* usually 4–12 in in diam, umbellules corymbose, spikes numerous *Spikelets* ⅜ by $\frac{1}{20}$ in, 10–20 fld, usually fine brown or reddish *Glumes* elliptic oblong obtuse, 3–5 nerved, scarcely keeled Wings of *rhacheola* ovate, acute, finally yellow or red brown separating by a clean cut *Stamens nut*, and *style* much as in *C macer*

Var *β ambigua*, C B Clarke l c (1884) 162, spikelets 1¼ in, glumes ⅛ in, wings of rhacheola narrow hardly separating Madras Peninsula, *Wallich*, n 3353 I, *in Herb Kew* (*not Herb propr*), and one of the two examples of n 3330, *in herb propr*

47 **C. Zollingeri,** *Steud in Zoll Verz Ind Archip* ii (1854) 62, *and Syn Cyp* 17, culm elongate leaves long narrow, umbel compound with long slender rays or sometimes reduced to 1 head, spikelets spicate long-linear yellow, glumes somewhat remote large, nut obovoid black ⅓ length of glume *Boeck in Linnæa*, xxxvi 352 C compressus, var *Thw Enum* 342 C rotundus *Miq Fl Ind Bat Suppl* 260, 600 C rotundus, var carinalis, *Benth Fl Austral* vii 280 C tenuiculmis, *Boeck l c* 286 (*not of Flora*, lxii 554) C Wightii, *Hance in Journ. Bot*

xvi 14 (*not of Nees*) C lucidulus, *C B Clarke in Journ Linn Soc* xxi 99, and xxv 80 (*not of Klein*, except by mixture) —Cyperus, *Wall Cat* 3321, 3367

Throughout moist INDIA, alt 500 5000 ft, plentiful, from NEPAL, *Wallich*, and ASSAM, *Griffith*, to CEYLON, *Thwaites*, and MALACCA, *Griffith* —DISTRIB Trop As, Afric, and Austral

Glabrous *Rhizome* short, horizontal, woody *Stems* solitary but not distant, of 1½–3 ft (small examples under a foot occur), slender for their length, triquetrous *Leaves* ⅔ stem, ⅙ in broad *Umbel* in well developed examples large straggling rays 4 10 up to 9 in with radioles of secondary umbels up to 3 in, but small 1-headed examples are frequent, with all intermediate forms bracts as long as umbel or greatly overtopping it *Spikes* large, open, rhachis glabrous *Spikelets* 3–16 often 1 by ⅛ in, 20 fld, compressed *Glumes* boat shaped, ovate, obtuse, 7 11-nerved, in fruit scarcely imbricated, rhachilla slender, in fruit flexuose, wings oblong hyaline separating *Stamens* 3 anthers linear oblong muticous *Nut* triquetrous, obtuse, style shorter than nut, slender, branches linear, slender

Sect 6 *Rotundi* Tall or medium plants, stoloniferous or rhizome woody Leaves and bracts long Rhachilla of spikelets winged Glumes closely imbricated (Sp 48–55)

48 **C. longus,** *Linn Sp Pl* 67, rhizome somewhat thick creeping ...ique or decum ... wiry rhizome ... ⅓–½ length of ... var α, *Boiss Fl Orient* v 375, vars β, γ, *C B Clarke in Journ Linn Soc* xxi 164, excl vars β, γ

QUETTA, *Hamilton* MT ABOO, *G King* —DISTRIB Westward to the Atlantic

Glabrous *Rhizome* ⅒–⅛ in in diam, clothed by loose ovate triangular striated brown scales *Stems* 1 3 ft *Leaves* ⅓–⅔ stem, ⅙ in broad *Umbel* rays 3–10, 1 10 in long *Spikelets* ½ by 1/12 in slightly compressed, greenish ferruginous or ...

description

49 **C. stenostachyus,** *Benth Fl Austral* vii 280, tall, stolons long with distant bulbous thickenings umbel compound compact spikelets densely spicate suberect (otherwise nearly as *C longus*) —Australia

Var *β indica*, lowest bract suberect very long, spikelets ferruginous brown C longus, *Linn* var *gracilis Boeck in Linnaea*, xxxvi 281 C deudatus, *Heyne, in Wall Cat* 3319, 3329 F —DECCAN PENINSULA, *Wallich*

50 **C. rotundus,** *Linn Sp Pl* 67 (*not Linn Herb*), stem at base nodosely thickened suddenly constricted into a wiry rhizome (otherwise nearly as *C longus*) *Roxb Hort Beng* 5 *and Fl Ind* i 197, *Kunth Enum* ii 58 (*excl C bulbosus, Vahl, and others*), *Boeck in Linnaea*, xxxvi

283, *Dil- & Gibs Bomb Fl* 283, *Thi Enum* 313 *partly; C B Clarke in Journ Linn Soc* xx 292 and xxi 167 *Ait h & Hems in Trans Linn Soc* ser 2 *Bot* iii 121 C hexastachyus *Rottb Descr et Ic* 28 t 14 fig 2, *Nees in Wight Contrib* 81 (*partly*) C leptostachyus *Griff Itin Notes* 321 (*not of Nees*) C tenuiflorus *Royle Ill* 412 (*not Rottb*) — Cyperus *Wall Cat* 3317 A (*partly*) 3322 3353 3373 C albidus, *Herb Heyne*, *Wall Cat* 3306, *Rumph Herb Amb* vi 1 t 1

INDIA, alt 0–6000 ft a pestiferous weed — DISTRIB All warm regions

Glabrous *Stolons* slender up to 4 8 in, hardening into wiry roots thickened into black woody ovoid tubers ⅓–1 in in diam not (or very obscurely) zoned *Stems* subsolitary, 4–32 in at top triquetrous *Leaves* long often overtopping stem, ⅛ ⅓ in broad *Umbel* frequently compound primary rays 2 8 in spikes loosely spicate of 3 8 spikelets but umbel sometimes large sometimes reduced to 1 head and (in a common Calcutta form) to 1 spikelet *Spikelets* in flower or fruit undistinguishable from *C longus*

Var β *centiflora* C B Clarke in Journ Linn Soc xxi 171, spikelets elongate many fld often curved or twisted MONGHYR *Wall Cat* 3373 (right hand example) The DECCAN *G Thomson* n 258 — In this (n 258) the spikelets are 3⅓ in, with 118 flowers but all forms intermediate between this and *C rotundus* occur

51 **C. stoloniferus,** *Retz Obs* iv 10 rhizome woody long creeping stems at top trigonous at base nodose umbel simple contracted or sub capitate spikelets terete shortly spicate glumes close packed concave ... iequally trigonous somewhat ... *in Linnæa* xxxv 489 (*excl* ... *i Journ Linn Soc* xx 286, ... C tuberosus *Bojer Hort Maurit* 379 *Kunth Enum* ii 50 *Dalz & Gibs Bomb Fl* 283 C rotundus part *Kunth l c* 59 C bulboso stoloniferus *Steud in Zoll Verz Ind Archip* ii 62 and *Syn Cyp* 18 C conjunctus *Steud Syn Cyp* 18 C lamprocarpus *Boeck l c* 43 C juncifolius, *Klein ms*, *Wall Cat* 3315 A C Jemenicus *Heyne Wall Cat* 3315, B C arenarius *Hance ms* — Cyperus *Wall Cat* 3309 mixed

Shores of INDIA especially in sea sand from Sind to Ceylon Coromandel, and the Malay Peninsula — Nilghiri Mts, *Foulkes* DISTRIB Mauritius, China, Malaya, Australia

Stolons long hardening into the creeping rhizome, not producing tunicated bulbils *Stems* 4–8 in *Umbel* rays 0 1 in, bracts usually 3 varying in length as do the leaves *Spikelets* ¼ by $\frac{1}{12}$ in, 8 20 fld, glumes more closely packed than in *C rotundus*, their margins often glistening hyaline

52 **C. Fenzelianus,** *Steud Syn Cyp* 33, tall, stolons long thickish leaves and bracts elongate, umbel large compound, spikelets (young and o... *Boeck in Lin*... *of D of nt*) ... *not of Boiss* *C B Clarke* *Flora* lxii 50...

MADRAS, Chingiput *G Thomson*, n 383 — DISTRIB Westwd to N Africa

Stems 2 3 ft, robust, at base somewhat nodose then suddenly narrowed into a creeping rhizome $\frac{1}{12}$–⅛ in diam *Leaves* often nearly as long as stems, ¼ in broad,

fleshy sometimes almost spongy, when dry convolute —Habit and gen ral *C longus*, but the root of large states of *C rotundus* Schweinfurth studied this whole series of species alive, doubts if any line can be drawn b *longus* and *C rotundus*

53 **C. subcapitatus,** *C B Clarke*, stems and leaves long umbel as though lateral of 24 spikelets contracted or subcapitate bract long narrow as though a continuation of the stem (otherwise as *C rotundus*) C polystachyus, *Rottb Descr et Ic* 39 t 11, —Cyperus *Wight in Wall Cat* n 3316

DECCAN PENINSULA Wallich. NILGHIRI HILLS alt 2000 ft *Gamble*

Stem 20 in, at top le s than $\frac{1}{10}$ in in d am, at base oblique nodosely th then abruptly contracted into a long slender rhizome *Leaves* somewhat than stem, $\frac{1}{5-6}$ in broad *Umbel* rays 0–$\frac{1}{2}$ in *Spikelets* slender, ferrug brown

54 **C. tuberosus,** *Rottb Descr et Ic* 28, t 7, fig 1, *fide Boeck* stolons elongate rather slender, stem tall at base bulbous woody, umb evolute rays slender (in form *C tenuiflorus*, sp Roxb, very slender) spikelets linear (in form *C tenuiflor* very slender) glumes in fruit not closely imbricated (otherwise as (*C rotundus*) *Roxb Hort Beng & Fl Ind* i 199 *Kunth Enum* ii 50 (*in small part*), *Boeck in Linnæa*, xxxvi 285 (*excl the Cape plants and descrip of nut*) C Pangorei *Ret. Obs* iv 10 (*not of Rottb or Roxb*) C lucidulus, *Klein Link Jahrb* iii 86 (*not of C B Clarke*) C rotundus *Benth Fl Austral* vii 27 (*chiefly*) C rotundus (tenuiflora) *Thw Enum* 343 C rotundus *var* procerula *C B Clarke in Journ Lin* rotundus *var* acuta *Boeck l c* 230 *in Wight Contrib* 82 (*Indian plant*) *Wats in E T Atkinson Gaz* x (1876) 140, *C B Clarke in Journ Linn S Rottb or Boeck*) C procerulus *N Enum* ii 51 C Retzii *Nees l c*, C hexastachyus, *Nees l c* (*partly*) pertenuis *Bojer Hort Maurit* 379 (*not Roxb*) C longus *Baker Fl Maurit* 411 C mitis, *Steud Cyp* 316 (*cf Boeck in Flora*, 1859, p 447) C procerus *Herb Roxb*, *Wall Cat* 3329, A

CEYLON *Thwaites* nn 3750, 3966 Deccan Peninsula, *Wallich*, *Wight* BENGAL *Wallich*, *Griffith* (*Kew Distrib* n 6141) —DISTRIB Mauritius, Austral

Equal in s ze to the large forms of *C rotundus* but has slenderer rays and

55 **C. esculentus,** *Linn Sp Pl* 67, stem at base erect, stolons lateral long very slender bearing tubers la ... bracts lon ... spikelets yellow or yellow brown, glumes ove ... striate (otherwise as *C rotundus*) ... xxxvi 257, *C B Clarke in Journ* ... Tenori, *Presl*, *Reichb Ic Fl Germ* ... and C jemenicus, *Herb Heyne*, *Wall Cat* 3354

From the PUNJAB, *T Thomson*, to NILGHIRI MTS, *Hohenacker*, scattered, not common.—DISTRIB S Europe, Afric, Americ

Stolons exceedingly slender, with small pale scales, often disappearing after the tubers are formed, tubers (ripe) woody, more regularly zoned than those of *C rotundus* *Glumes* in fruit slightly rigid, so that they are less closely imbricated (than in *C. rotundus*) the spikelets more turgid —So close to *C rotundus* that it is much mixed with it in many herbaria

Sect 7 EXALTATI Tall Stolons 0 Leaves and bracts long Umbel large compound, spikes and spikelets many Rhachilla of spikelets conspicuously winged Anthers apiculate, not rarely crested Style (with its 3 branches) small Nut small, ashy black (Sp 56–61)

56 **C. radiatus,** *Vahl Enum* ii 369, spikes digitate scarcely peduncled long cylindric dense, spikelets linear 12–30-fld, glumes (even in fruit) closely imbricate, wings of rhachilla oblong persistent, anthers short-oblong not crested, *Kunth Enum* ii 71, *Boeck in Linnæa*, xxxvi 317, *C B Clarke in Journ Linn Soc* xxi 185 C involucratus, *Poir in Lam Encyc* vii ... *Kunth l c* 71, *Nees in Wight* ... *not Roxb*) C Roylei, *Arn in* ... C obscurus, *Nees in Hook K*

From AGRA, *Munro* to PENANG, *Curtis*, plentiful in Bengal —DISTRIB As, Afric, Amer

Glabrous *Stems* 1–3 ft *Leaves* often ⅔ stem ⅓ in broad *Umbel* simple or compound, spikes 1 by ⅓ in, very dense *Spikelets* commonly ½– by $\frac{1}{20}$ in, usually dull-colrd, not bright yellow or red brown *Glumes* broad ovate, keeled, obtuse, 3–5-nerved on back, muticous or sometimes mucronate *Nut* ovoid, ⅔–½ length of glume style ½ as long as nut branches 3 linear small

57 **C. exaltatus,** *Retz Obs* v 11, spikes (some) peduncled long-cylindric, spikelets very many (not tightly crowded) linear 8–20 fld, glumes (even in fruit) closely imbricate wings of rhachilla oblong persistent, anthers oblong not crested, *Kunth Enum* ii 70, *Nees in Wight Contrib* 84 (*excl C fastigiatus*), *Thw Enum* 343, *Boeck in Linnæa*, xxxvi 319, *C B Clarke in Journ Linn Soc* xxi 186 (*incl* var β *amœna*) C. odoratus, *Burm Fl Ind* 20 t 8, fig 2 (*not Linn*) C venustus, *Br Prodr*. 217, *Kunth l c* 68 (*partly*), *Thw Enum* 432 C umbellatus, *Roxb Fl Ind* i 205, *Dalz & Gibs Bomb Fl* 284, *Arn in Wight Contrib* 85 in *Obs*. (*not Benth*) ... *ms*; *Arn l c* 84 ... racemosus, *Heyne* ... *næa*, xxxvi 310) ... unth *Enum* ii 11 ... *Fl. Bras* ii (par ... osus, spicatus, *Herl* ... *it & Herb Ham*,

From the ... and subtrop regions

Stem 3–6 ft —Hardly to be distinguished from large forms of *C radiatus*, but by the less dense spikes *Spikelets* often brightly coloured

Var β *dives* C B Clarke l c ... hard spreading at right angles *Egypt*, 5, t 4, fig 3, *Kunth Enu* ... *Boeck in Linnæa*, xxxvi 322 — *Hooker* —Africa

1 M. D. . . . .

into 1
ratus,
Flora

Pl 32
Linn Syst Veget (ed xiii) 81

LOWER BENGAL *Wallich* S DECCAN, up to 5000 ft, *Rottler, Wight* CEYLON, *Thwaites*, C P 855 2912, &c MALAY PENINSULA, from Pegu, SINGAPORE
DISTRIB Afric Borneo

2 M. . . .

DECCAN PENINSULA *Rottler, Heyne*, Palavarum to Permacoil, in the hills, *Wight*, N Canara *Young*

Glabrous *Stems* 3–8 in, thickish, trigonous striate, stolons elongate, $\frac{1}{12}$ in ... ong as stem, ... about 7, on rays ... *ikelets* ... in, ... *l* striate, straw-

Subgen II EU-MARISCUS Base of *stems* not oblong thickened by much dilated leaf sheaths (though often slightly nodose) *Rhacheola* of spikelets only breaking up at *one* node, viz that above the two lowest empty glumes

Sect. 1 Umbellati *Leaves green Spikelets green or becoming yellow, bearing 1–2 (very rarely 3) nuts Lowest glume of spikelet (bracteole of some) very acute, aristate*—[Nearly all are considered by Bentham as varieties of his *Cyp umbellatus*] (Sp 3–7)

3 **M. paniceus,** *Vahl Enum* ii *partly*, stolons long slender, umbel simple bracts 4–5 long, rays unequal usually short, spikes solitary cylindric dense ebracteate, spikelets small 1 fld in fruit broad lanceolate trigonous curved more or less recurved *Nees in Wight Contrib* 89,

Kunth Enum ii 119 (*in small part*) M Wallichianus, *Kunth l c* 117. M Pullu, *Steud Syn Cyp* 66 Kyllinga panicea, *Rottb Descr et Ic* 15, t 4, fig 1 Cyperus paniceus *Boeck in Linnæa* xxxvi 381 (*fig of Rottler only*) C umbellatus *Thw Enum* 345 (*not of Roxb*) C umbellatus *var* panicea, *C B Clarke in Journ Linn Soc* xx 296, and xxi 201 —Mariscus, *Wall Cat* 3433, 3135, *partly*, 3437 B, *partly*

From LOWER BENGAL to CEYLON —DISTRIB Mauritius

Glabrous, slender *Stolons* 2–3 by $\frac{1}{15}$ in, clothed by lanceolate striate rich-brown scales *Stems* 4–12 in, trigonous, nodose at base *Leaves* often as long as stem, $\frac{1}{8}$–$\frac{1}{6}$ in broad, flaccid *Rays* of umbel 0–1½ in, bracts often 4 in, leaf like *Spikes* ½ by ⅓ in exactly cylindric ultimately pale *Spikelets* (ripe) ⅛ by $\frac{1}{24}$ in, apparently 4-glumed, 2 lowest glumes empty persistent 3rd glume nut bearing, ovate deciduous, its upper margin broad scarious nerveless enclosing nut, 4th glume (really the rhacheola of the upper suppressed flower), lanceolate, tip rudimentary glume) elongate l *Nut* oblong trigonous, black ⅔ length of glume

Var β *Roxburghiana*, larger, stems up to 2 ft, rays of umbel up to 2 in, bracts 5 7, spikelets larger ¼ in long (1 fld) M cyperinus *Nees in Wight Contrib* 90, var *a* (*not of Vahl*) Kyllinga umbellata, *Roxb Ic Ined* t 191 Scirpus echinatus, *Linn Sp Pl* 50 the Ceylon plant, see *Trimen in Journ Linn Soc* xxiv 135 —Mariscus, *Wall Cat* 3434 3435 B (*partly*) —From Simla to Ceylon —Distrib Java —Rhacheola (above the nut-bearing glume) winged as long as nut, terminated by a rudimentary glume or by a very small triangular lanceolate plate

4 **M. cyperinus,** *Vahl Enum* ii 377, rhizome hardly any, umbel simple, bracts 5–7 long, rays short or curved, spikes solitary broad cylin-

Linnæa, xxxvi 381 (*the 2 fld Java plants*) C umbellatus *forma* cyperina, *C B Clarke in Journ Linn Soc* xxi 200 —Mariscus, *Wall Cat* 3431, 3435 A, *partly*, 3436

NORTH WEST INDIA Moradabad, *Thomson* COROMANDEL, *Roxburgh*, &c CEYLON, *Thwaites* MALAY PENINSULA, *Griffith*, &c —DISTRIB As trop, Polynesia

Glabrous *Rhizome* perennial, hardly ⅜ in Rays of *umbel* 5–10, rigid acutely triquetrous *Spikes* ¾ by ⅓ in ebracteate *Spikelets* ⅕ by $\frac{1}{20}$ in, in fruit obliquely erect, dusky reddish green —Otherwise as *M paniceus*

Var β *bengalensis*, umbel contracted into 1 head, spikes shortly cylindric or

[illegible]

glumes (with ripe nuts) somewhat distant

5 **M. pictus,** *Nees in Wight Contrib* 90 (*chiefly*), rhizome short,

[illegible] *(partly)* C umbellatus, *var a* typical (*partly*), *C B Clarke in Journ Linn Soc* xxi 200 (not *var.* γ picta, 201) —Mariscus, *Wall Cat* 3435 A (*partly*)

DECCAN PENINSULA, *Heyne*, &c

Resembles *M cyperinus* or *paniceus* β, but differs much in the structure of

Veget Andamans, 51, *Boeck in Linnæa*, xxxvi 340 —Cyperus, *Wall Cat* 3359 (*mainly*) —*Rheede Hort Mal* xii 103, t 55

From BENGAL to CEYLON and SINGAPORE —DISTRIB Trop Afric, Malaya, Austral, Polynes,—mostly near the sea

Stems 1 3 feet *Leaves* often nearly as long as stem, ¼ in broad Rays of *umbel* often 4 in *Spikes* cylindric or ovoid, cinnamomeous red or brown or straw colour

Sect 4 Flabelliformes *Spikelets subulate, bearing 4–14 nuts*

12 **M. microcephalus,** *Presl Rel Haenk* i 182, large, leaves and bracts spongy, umbel compound or decompound, spikes stellately globose brown spikelets straight, glumes obtuse rather remote, nut narrowly obovoid top conic almost beaked M dilutus, *Nees in Wight Contrib* 90 M giganteus *Boeck in Flora*, xlii 443 Cyperus compactus, *Retz Obs* v 10 *fide Kunth* C dilutus, *Vahl Enum* ii 357 *Kunth Enum* ii 92, *Thw Enum* 344, *Boeck in Linnæa*, xxxvi 351, *Kurz Rep Andamans* 54 *and in Journ As Soc* xlv (part 2) 158 *C B Clarke in Journ Linn Soc* xxi 193 C spinulosus, *Roxb Fl Ind* i 203 —Mariscus, *Wall Cat* 3430, 3439

Throughout INDIA, alt 0–3000 ft from MUSSOOREE and ASSAM to CEYLON and PENANG —DISTRIB Mauritius China, Malaya

Glabrous *Rhizome* short *Stems* 1–3 ft *Leaves* nearly as long as stem, ¼ in broad *Umbel* often 8 12 in in diam, spikes of 20–40 spikelets *Spikelets* sometimes ⅜ by $\frac{1}{24}$ in bearing 14 nuts, often *much shorter bearing 4–8 nuts* *Nut* bearing *glumes* boat shaped with 9 faint nerves Wings of rhachilla oblong, hyaline persistent

Subg III TORULINIUM (*Gen Desv*) Spikelets bearing several nuts, rhacheola finally breaking up into joints each containing 1 nut

13 **M. ferax,** *C B Clarke*, large or middle sized, umbel usually large compound, spikelets numerous spicate linear bearing 4–16 small oblong black nuts, which fall off in the joints of rhacheola held by the persistent wings Cyperus ferax *L C Rich in Act Soc Hist Nat Paris* i 106, *Kunth Enum* ii 89, *Boeck in Linnæa*, xxxvi 399, *C B Clarke in Journ Linn Soc* xx 295 (*excl syn C lutens*) and xxi 191 C odoratus, *Forst Prod Ins Austral* 6 *Boeck in Linnæa*, xxxvi 407 (*not of Linn*) C ferox, *Vahl Enum* ii 357 C pennatus *Herb Mus Paris*, *Boeck l c* 404 (*not of Lam*) Dichidium ferox, *Schrad in Mart Fl Bras* ii, pars 1, 54

BENGAL, Furidpore, *C B Clarke* PEGU *Kurz*, n 2686 MERGUI, *Griffith* (*Kew Distrib* nn 6143 6198) —DISTRIB All warm [illegible]

6 COURTOISIA, *Nees*

Glumes persistent 2 lowest empty, 1-3 succeeding (in the Indian species) bisexual nut bearing winged on keel rhacheola disarticulating above the two lowest empty glumes Otherwise as *Mariscus* —Species 2 or 3, in Africa Madagascar, India

C. cyperoides, *Nees in Linnæa,* ix [1834] 286, *and in Wight Contrib* 92, umbel compound, spikes globose very dense yellow brown spikelets compressed very flat broad elliptic containing 1-2 nuts, style 3 fid, nut narrow oblong ⅔ length of glume *Arn in Edinb N Phil Journ* xvii 262 *Kunth Enum* ii 127, *Boeck in Flora* xliv 335, *and in Linnæa,* xxxv 434 *Benth in Hook Ic Pl* t 1341 Kyllinga cyperoides, *Roxb Fl Ind* i 182 Mariscus cyperoides *Dietr Sp Pl* ii 348 Cyperus Kleinianus *Hochst in Herb Hohenack* n 645 C glomeratus, *Klein ms* — *Wall Cat* 3537

From SIKKIM and ASSAM to MADRAS and PEGU, alt 0-6000 ft, frequent — DISTRIB Madagascar

Glabrous annual *Stems* 3-16 in, caespitose *Leaves* often as long as stem, ⅙ in broad nearly smooth *Umbel* rays 3-10 up to 1-4 in long, bracts 3 7, up to ... teoles of umbellules often ... s boat shaped flattened, ... length sides not striate ... yramidal at top, almost ... ubquadrate *Style* short,

7 ELEOCHARIS, *R Br*

... sheaths few ... barren leaf- ... e) terminal ... t," (but not ... nut bearing, ... tabescent ... often small or 0) *Stamens* 3-1 ... anthers linear oblong, not crested *Style* linear, as long as the nut, branches 3 or 2, linear, style-base dilated, constricted or apparently articulated on the nut but usually persistent *Nut* obovoid, plano-convex (when style bifid) or trigonous (when style trifid) —Species 113, cosmopolitan.

Sect I LIMNOCHLOA, *Nees in Wight Contrib* 114 (*not of Lestib*); stems stout or medium, spikelets elongate, many fid, glumes subrigid, plano-concave, not (or scarcely) keeled, of one colour nearly —All stoloniferous

* *Nut smooth* (i e outer cells small, quadrate hexagonal, inconspicuous). *Style* 2-3 fid.

1 E. plantaginea, *Br Prod* 224 (*in note*), stems robust terete transversely septate wher ... wider than stem style 2-3 fid ... *Enum* 352 E tumida, *Roem* ... antagi-noides, *Rottb Descr et I* ... *Obs* v. 14 *Roxb Fl Ind* i 21... dubius, *Roxb l c* 215 (specimen imper-

fect) S tumidus, *Roxb l c* Limnochloa plantaginea and tumida, *Nees in Wight Contrib* 114 Heleocharis plantaginea, *Boeck in Linnæa*, xxxvi 474 in small part Eleocharis, *Wall Cat* 3451 (*except B*)

From SIND, SAHARUNPORE and ASSAM to CEYLON and the MALAY PENINSULA —DISTRIB Tropics of Old World

Stolons long $\frac{1}{8}$ in diam *Stems* 1 3 ft, $\frac{1}{8}$-$\frac{1}{4}$ in diam, slender (*Sc plantagineus*, Roxb), or stout (*Sc tumidus*, Roxb), sheaths membranous, soon torn *Spikelet* 1-1½ by $\frac{1}{6}$-$\frac{1}{4}$ in (in some Madagascar examples 3½ in long) *Glumes* $\frac{1}{5}$ in, suberect, densely packed, obovate, with numerous striations on the back, 1-3 lowest empty persistent, lowest stouter appearing as though a continuation of the stem *Bristles* 7, equalling or exceeding the nut, retrorsely scabrous, yellow-brown *Nut* rather large, $\frac{1}{3}$-$\frac{2}{5}$ of glume, biconvex or obscurely trigonous, style-base depressed conic, brown-black The American plants referred to *plantaginea* by Boeckeler are very distinct (*E interstincta*, Br) (see Benth Fl Austral vii 292)

2 **E equisetina,** *Presl Rel Hænk* i 195, stems slender terete transversely septate when dry, spikelet fuscous straw colrd wider than the stem, style 2 fid

CEYLON, W [illegible] N Caledonia, Philippines

Stems 1 foot [illegible] e fitting, firm, terminated on one side by [illegible] oid, somewhat narrowed triangularly at [illegible] I cannot distinguish the Ceylon from the Philippine examples

** *Nut reticulate or trabeculate Style 3 fid, rarely 2 fid*

3 **E. variegata,** *Kunth Enum.* ii 153, stems robust nearly terete not transversely septate, glumes suberect laxly imbricate red brown near their margin, bristles 7 retrorse scabrous about as long as the cancellate nut. Heleocharis variegata, *Boeck in Linnæa*, xxxvi 470 — Mascarene Isles

Var *laxiflora*, stems more slender, subtrigonous under narrower spikelet, glumes fuscous green not red brown near margin, bristles longer than finely trabeculate nut Scirpus laxiflorus, *Thw Enum* 435 —Eleocharis, *Wall. Cat* 3451, B (*partly*)

ASSAM, *Simons* SILHET, *J D Hooker* CEYLON, *Thwaites*, MALAY PENIN- [illegible]

[illegible] series, the nut appearing longitudinally 30-40 striate

4 **E. ochrostachys,** *Steud Syn Cyp* 80 (*not of Boeck*), stems slender nearly terete not transversely septate many barren intermixed, spikelet slender scarcely broader than the stem, glumes suberect laxly imbricate dusky green, style 3 fid. Heleocharis subulata, *Boeck. in Flora*, xli 112

MALACCA; *Griffith* SINGAPORE, *Ridley* —DISTRIB Java, Borneo

Stems 8 by $\frac{1}{24}$-$\frac{1}{16}$ in *Spikelet* less than $\frac{1}{2}$ in —This does not differ much from very slender examples of *S variegata*, var *laxiflora*, except by the numerous barren stems.

5 **E. fistulosa,** *Schultes in Roem & Sch Syst* ii *Mant* 89, stems robust not transversely septate triquetrous under the spikelet, spikelet

nearly an inch acute, bristles 6 as long as the cancellate nut retrorsely scabrous, style usually 3-fid E acutangula and media, *Schultes l c.* 91. E planiculmis, *Steud Syn Cyp* 80, *Zoll Verz Ind Archip* ii 62 Scirpus fistulosus, *Poir Encycl* vi 749 S acutangulus and medius, *Roxb Fl. Ind* i 213 Limnochloa media and acutangula, *Nees in Wight Contrib* 114 Heleocharis fistulosa, *Boeck in Linnæa*, xxxvi 472.—Eleocharis, *Wall Cat* 3453

From NEPAL and ASSAM to BURMA and CEYLON —DISTRIB Tropics generally

Stems 1-3 ft by $\frac{1}{3}$ in *Spikelet* scarcely broader than the stem, dusky green *Glumes* $\frac{1}{4}$ in, suberect, obovate, rather laxly imbricate, dirty straw-colrd *Nut* as long as $\frac{1}{2}$ glume, unequally biconvex, obovoid top narrowed, style base ovoid conic, outermost cells transverse oblong, superposed in 24-40 vertical series, nut hence longitudinally striate

6 **E. spiralis,** *Br Prod* 224 (*in note*), stems robust not transversely septate triquetrous under spikelet, spikelet $\frac{2}{3}$-1 in obtuse, glumes obtuse subtruncate, bristles much shorter than cancellate nut irregular smooth. *Thw Enum* 352 (*excl syn media*) Scirpus spiralis, *Rottb Descr et Ic.* 45, t 15, fig 1, *Roxb Fl Ind* i 212, *Wall Cat* 3454, B (*partly*) S mutatus, *Roxb mss* Limnochloa spiralis, *Nees in Wight Contrib* 114

S INDIA, not common, E BENGAL, *Griffith*, *Kurz* BOMBAY, Salsette, *Jacquemont* DECCAN PENINSULA, *Wallich* BURMA, *Griffith*, &c CEYLON, *Thwaites*, &c —DISTRIB Mauritius?

Stems 2 ft by $\frac{1}{8}$-$\frac{1}{6}$ in *Spikelet* $\frac{1}{6}$-$\frac{1}{5}$ in diam, very dense, marked by a spiral line apparently i e the summits of the very erect close regular glumes *Glumes* obovate, summit much depressed triangular nearly truncate *Style* 2 3 fid

Sect II ELEOGENUS, *Nees in Wight Contrib* 112 (Genus); stems slender or medium, spikelets many or few-fld, usually wider than the stems, glumes membranous, usually 1-3 nerved, keel green, style 2-fid — Heleocharis (Genus), *Lestib Essai Cyp* 41

7 **E. atropurpurea,** *Kunth Enum* ii 151, roots fibrous, stems slender, spikelet small ovoid or subcylindric, bristles retrorsely scabrous

WEST HIMALAYA, alt 3000 ft, to ASSAM and CEYLON.—DISTRIB. Tropics generally, except Malaya

Stems 2-6 in *Spikelet* $\frac{1}{8}$-$\frac{1}{6}$ in, many fld. *Glumes* broad, obtuse, black-chestnut, keel green *Bristles* in the Indian tropical examples usually 7-5, as long as the nut, in the Himalayan (as in the European) examples 0 or very small. *Nut* minute, obovoid, compressed, as long as $\frac{1}{4}$-$\frac{1}{3}$ glume.

8 **E. capitata,** *Br Prod* 225, roots fibrous, stems somewhat slender, spikelet small dense obtuse, bristles as long as nut retrorsely scabrous brown or ferruginous, nut black smooth, style 2-fid base small depressed

BEHAR and BENGAL to CEYLON and SINGAPORE, not common —DISTRIB Most warm countries

Stems 2–14 in *Spikelet* ⅛–½ in, pale *Bristles* 7, or fewer *Nut* as long as glume, compressed, obovoid —Usually easily distinguished from *E atropurpurea* by its larger size, but small examples can hardly be separated except by the coloured *bristles* (which are glistening white in *E atropurpurea*)

9 **E. ovata,** *Br Prod* 224 (*in note*), roots fibrous, stems somewhat slender, spikelet small dense, bristles exceeding the nut retrorsely scabrous brown, nut straw colrd or brownish smooth, style 2 fid base broad triangular *C B Clarke in Journ Bot* xxv 268 Scirpus ovatus, *Roth Catal* i 5 Eleogenus ovatus, *Nees in Linnæa*, ix 294 Heleocharis ovata, *Boeck in Flora*, xlııı 2 and *in Linnæa*, xxxvi 462, *Boiss Fl Orient* v 387

INDIA, *Wallich*, 3487 (*partly in Herb Kew*) —DISTRIB Tropics and temp regions

Very much resembles *E capitata*, except in the colour of the nut, and the shape of the style base

10 **E. palustris,** *Br Prod* 224 (*in note*), rhizome creeping, stems

From the W HIMALAYA, ascending to 12 500 ft, to SIND and BENGAL.—

sheath ⅓ in, about stles 6, as long as nut, retrorsely scabrous, in numbers and length *Stamens* spikelet, and in small depauperate unequally biconvex, obovoid much beak; style base contracted below or shortly longitudinal oblong, obsc prominent i e nut ret culated

Sect. III ELEOCHARIS proper—As Sect II (Eleogenus), but style 3 fid —Limnochloa, *Lestib Essai Cyp* 41 (*not of Nees*)

* Aciculares *Nut trabeculate* i e its outer transversely oblong small cells superimposed in vertical series so that the nut appears longitudinally striate

11 **E. acicularis,** *Br Prod* 224 (*in note*), rhizome filiform, stems capillary, spikelet slender few fld, style 3 fid, nut oblong lanceolate straw-

colrd *C B Clarke in Lond Journ Bot* xxv 270 Scirpus acicularis, *Linn Sp Pl* 71 (*partly*), *Reich Ic Fl Germ* t 294, eleocharis, *Boeck in Linnæa*, xxxvi 431 Chætocyperus costulatus *Nees et Meyen Pl Meyen*, 96

MADRAS PENINSULA, *Rottler* (*Herb Kew*) —DISTRIB Europe, N & E Asia, America

Stems 2–4 in *Spikelet* ¼ in, with 4–6 (rarely 8–10) nuts *Glumes* in the few-fld spikelets subremote lower 2–3 stichous, upper distinctly spiral *Bristles* 3 4, white, feebly retrorse scabrid, variable in length, occasionally wanting *Nut* as long as ⅓–½ the glume polyhedral subterete, with 12–15 longitudinal ribs, style base small narrow bulbiform

** Chætarieæ *Nut coarsely prominently cancellate*, i e its outer sub-quadrate large cells prominent

12 **E. Chætaria**, *Roem & Sch Syst* ii 154 and *Mant* ii 90, roots fibrous stems small, spikelet small few fld style 3 fid, nut triquetrous white truncate E setacea *Br Prod* 224 (*in note*), not 225 Cyperus setaceus, *Retz Obs* v 10 *Roxb Fl Ind* i 185 Chætocyperus Limnocharis *Nees in Wight Contrib* 96 Ch setaceus *Nees in Linnæa*, ix 289, *Miq Fl Ind Bat* iii 298 *Thw Enum* 351 Heleocharis Chætaria, *Boeck in Linnæa*, xxxvi 428 —Isolepis *Wall Cat* 3485

BENGAL to CEYLON and MALACCA —DISTRIB Tropics

Rhizome 0 or sometimes nearly an inch, filiform white *Stems* usually 1–4 in, occasionally 6 10 in, uppermost sheath lax, whitened, scarcely torn *Spikelet* ⅛ in with 1–4 nuts *Glumes* sub listichous upper spiral *Bristles* 6, as long as nut, retrorsely scabrous, pale, occasionally smaller or obsolete *Nut* as long as ½ glume, the acute angles sometimes excurrent at its shoulder, outer cells in each face in 6–10 series, sometimes perforated style base depressed conic

*** Leiocarpicæ *Nut smooth*, i e outer cells quadrate hexagonal or shortly longitudinal oblong obscure so that the nut is neither distinctly striated nor distinctly reticulated

13 **E.** [illegible] Heleocharis) [illegible] er glumes [illegible] base linear-

KHASIA HILLS, alt 4–5000 ft, *C B Clarke*, NILGHIRI HILLS (fide Boeckeler) —DISTRIB Madagascar

Roots fibrous, or (fide Baker) slender stolons sometimes present *Stems* 4–16 in, uppermost sheath truncate *Spikelet* ⅙–⅓ in, few fld, sometimes longer clavate with many empty lower glumes *Bristles* 6, as long as nut, retrorse-scabrous, pale ferruginous *Nut* as long as ½–⅔ the glume, trigonous, olive, narrowed at top into an exceedingly short narrow neck, style base very much narrower than nut, wider than neck of nut

14 **E. afflata**, *Steud Syn Cyp* 76, caespitose, stems slender uppermost sheath truncate spikelet dense sometimes proliferous, nut obovoid yellowish green, base large pyramidal, style 3-fid, *Miq Fl Ind Bat* iii 299 E subprolifera, *Steud l c* 80, *Miq Fl Ind Bat* iii. 300. Scirpus afflatus, *Benth Fl Hongk* 391 Heleocharis subprolifera *Boeck in Linnæa*, xxxvi. 426 H Thomsoni, *Boeck l c* 451. H. ochrostachys, *Boeck l c* 452 (*not of Steud*) H chlorocarpa, *B*

Flora, lxi 1878, 34 H Kuntzei, *Boeck. Cyp Nov* i 14—Eleocharis sp n 3, *Herb Ind Ord H f & T Th*

KHASIA HILLS alt 0-6000 ft , ASSAM; *Griffith*, MUNNIPORE, *Watt*; BURMA, *Griffith*, &c —DISTRIB F Asia, Java

Stems 4-16 in , 4-6 striate, uppermost sheath with an oblique triangular (scarcely mucronate) mouth *Spikelet* ½-⅓ in , lower glumes in numerous spires *Bristles* 6 or 5-4, as long as nut, retrorsely scabrous, pale brown *Nut* as long as ⅓-⅔ glume, trigonous, top slightly narrowed truncate closely applied to style base (not forming a minute neck under it)

15 **E. congesta,** *Don Prodr.* 41, caespitose, stems slender, uppermost sheath truncate with a lateral tooth, spikelet dense sometimes proliferous, style 3 fid, nut obovoid narrowed at top yellowish brown, style-base bulbiform E palustris (? Br vel sp nova) *Strachey Cat Pl Kumaon*, 73 E ovata, *Thw Enum* 351 (*not Br*) Scirpus congestus, *Spreng Syst Cur post* 27—Eleocharis purpurascens, *Boeck in Linnaea*, xxxvi 455

Throughout INDIA, alt 3-6500 ft. (except Bengal) KASHMIR, *C B Clarke*, NEPAL, *Wallich*, CHOTA NAGPORE, *C B Clarke*, NILGHIRI HILLS, *Perottet*, CEYLON, *Thwaites*

angular (as *E.* ooth ⅛ in long therwise as *E palustris,* and trigonous

nut

16 **E. tetraquetra,** *Nees in Wight Contrib* 113, rhizome short, stems 4-3 quetrous, spikelet oblong ellipsoid dense, bristles 6 longer than nut brown re fid *Thw Enum* 351 eleocharis tetraquetra *I* eck *l c* 448 H alt *Franch & Sav Fl Japon* ii 544 (*not of Boeck*) S Hakonensis and S Onaei, *Franch & Sav l c* ii 110, 111 S petasatus, *Maxim in Bull Soc Mosc* liv 64—Eleocharis, *Wall Cat* 3452

Throughout INDIA in the hills, alt 1500-11,000 ft , from KUMAON to SIKKIM, and the KHASIA HILLS to CEYLON and BURMA—DISTRIB E Asia, Australia

Rhi. times p times a of the exampl yellowis scabrous.

8 **FIMBRISTYLIS,** *Vahl*

Stems tufted, roots fibrous or woody, short, stolons 0 (except in *F stolonifera & Perottii*) *Leaves* only near base of stem *Inflorescence* terminal, umbellate, corymbose or reduced to few (or one) spikelets *Spikelets* solitary or clustered, many-fld *Glumes* imbricate on all sides or (in Sect *Abildgaardia*) lower distichous or subdistichous, uppermost nut bearing spiral, 1-2 (rarely 3) lowest empty, several succeed

ing with bisexual flowers deciduous, upper tabescent *Stamens* 3 or 2–1, anterior, anthers not (or shortly) crested *Bristles* 0 *Style* long or longish, often villous, 3- or 2 fid, deciduous (leaving no button), or persistent, style base dilated, constricted below the dilatation *Nut* obovoid (very rarely oblong) obtuse, gynophore more or less prominent, sometimes dilated at apex into an obscurely 3 lobel saucer —Species 125, all warm regions

CONSPECTUS OF THE SECTIONS (exceptions omitted)

Sect I ELEOCHAROIDES	Stems with one spikelet	Sp 1–9
Sect II DICHELOSTYLIS	Style 2-fid	
Series A	Spikelets solitary	Sp 10–26
Series B	Spikelets clustered	Sp 27–30
Sect III TRICHELOSTYLIS	Style 3 fid	
Series A	Spikelets solitary	Sp 31–45
Series B	Spikelets clustered	Sp 46–51
Sect IV ABILDGAARDIA	Lower glumes distichous	Sp 52–58

Sect I ELEOCHAROIDES *Benth Fl Austral* vii 301 Lowest fertile glumes of the spikelet spirally imbricated, stems with 1 spikelet (1–3 in *F polytrichoides*)

* *Style 2 fid, nut biconvex*

† *Nut oblong, style subpersistent*

1 **F. tetragona,** *Br Prod* [1810] 226, stem nearly leafless, spikelet somewhat large conic dense fld style branches 2 short, nut reticulate straw colrd *Benth Fl Austral* vii 305 F cylindrocarpa *Kunth Enum* [illegible] *in Journ As Soc* xxxix part 2 [illegible] *Miq Fl Ind Bat* iii 316 F [illegible] efoliata, *Boeck in Flora*, xlii. [illegible]

Throughout INDIA, except the North-West, alt 0 3000 ft, from NEPAL and BOMBAY to CEYLON and TAVOY —DISTRIB E Asia, Australia

Glabrous *Stems* 4 24 in, tufted, obscurely quadrangular, uppermost sheath laterally mucronate or produced, sometimes up to 1–1½ in, lanceolate, coloured, hardly foliaceous *Spikelet* ½–⅔ in, terete, erect *Glumes* oblong, truncate, scarcely mucronate, keeled, horizontally spreading, 2 or 3 lowest empty, ovate, much [illegible] *Stamens* 2 (rarely 3) *Style* long, flattened, villous nearly to [illegible] ous [illegible] 9

†† *Nut obovoid, transversely wavy wrinkled or ridged* (outermost cells longitudinally oblong)

2 **F. acuminata,** *Vahl Enum* ii 285, stem leafless with one erect lanceolate spikelet, style 2 fid, nut obovoid transversely wavy wrinkled straw-colrd rarely becoming discoloured brown *Nees in Wight Contrib* 96, *Miq Fl Ind Bat* iii 314, *Thw Enum* 348, *Boeck in Linnæa*, xxxvii 3 F acicularis, *Br Prod* 226 Scirpus scaber, *Roxb Fl Ind* i 229 Eleogiton scabra, *Dietr Sp Pl* ii 99 —Isolepis ?, *Wall Cat* 3467 B (*partly*), 3494

AON and ASSAM, to CEYLON and

pale or chestnut with green keel, lowest
Stamens usually 2 *Style* nearly as long
branches shorter than style *Nut* as long
transverse ridges

3 **F. setacea,** *Benth in Hook Lond Journ Bot* ii [1843] 239, stem bristle ... slender erect lanceolate spikelet style 2 f ... white
F acumina ... *annæa*, xxxvii 4 I

5 BURMA, *Kurz* SINGAPORE, *Kurz*, *Ridley* —DISTRIB Amboyna, N Australia

Stem 4–6 in *Spikelet* ¼ by $\frac{1}{12}$ in *Glumes* pale, thin, almost (except keel) hyaline —Differs from *F acuminata* by its slenderness and very small nut

Var *brevifolia* (sp) *Steud l c* 72 (sub *Abildgaardia*), leaves more or less developed, sometimes nearly as long as stem —Philippines, Australia

4 **F. nutans,** *Vahl Enum* ii [1806] 285, stem nearly leafless, spikelet oblong or ovoid often oblique style 2 fid nut obovoid transversely wavy wrinkled white rarely discoloured *Nees in Wight Contrib* 96, *Thw Enum* 348 *Boeck in Linnæa* xxxvii 5 Scirpus nutans *Ret Obs* iv I

... *C B Clarke* BURMA *Griffith* &c NICOBARS, Borneo, China Australia
...lumes rusty-brown, lowest a little larger, —Hardly differs from *F acuminata* but

††† *Nut obovoid, smooth reticulate* (i e outermost cells arranged as brick-wall parenchyma)

F. ... slender, glabrous ...let glumes ovate ...tly white scaly on ...3 F sub bulbosa ...a xxxvii 4 (*not of* Isolepis ?, *Wall* fig 1

From BENGAL to CEYLON and MALACCA, common near the sea —DISTRIB Tropics of Old World

Stems 1½–... puberulous

Var HALOPHILA (sp) *Kurz ms*, stems and leaves stouter, spikelet up to ½ by ⅓ in —BENGAL; Soondreebun, *Kurz* MADRAS, Nellore, *Gamble*

6 **F. tenuicula,** *Boeck in Linnæa*, xxxviii 385, stem bristle-like, sheaths hairy, spikelet cylindric lanceolate, glumes ovate obtuse minutely

mucronate style 2 fid nut smooth brown obscurely white scaly on shoulders

SYLHET *C B Clarke* TENASSERIM *Helfer*

Stem 4–8 in *Spikelet* ¼ by $\frac{1}{10}$ in *Glumes* suberect d rty stra v colour keel

acuter spikelet

** *Style* 3 *f l* n t t go ous

7 **F. pauciflora,** *Br P*

lanceolate pale style 3 fid

Lenth Fl Austral vii 303

Ind Pat iii 314 *Boeck*

Hook Lond Jour Bot ii [1843] 239 *Miq Fl Ind Bat* iii 315 F malaccana *Boeck in Flora* xli 97 Trichelostylis filiformis *Nees in Wight Contrib* 10? Isolepis? *Wall Cat* 3488

From MERGUI *Griffith* to SINGAPORE *Wallich*—DISTRIB E Asia Malaya N Australia

8 **F. Kingii,** *C B Clarke ms Boeck Cyp Nov* ii 40 stem slender hairy spikelet ovoid ellipsoid glumes ovate obtuse style 3 fid, nut obovoid dusky black minutely scabrid

NILGHIRI HILLS alt 6–8000 ft

Rhizome very short *Stems* 4–12 in tufted *Leaves* as long as ½–¾ stem narrow hairy *Spikelet* ½ in terminal erect terete dense fld. *Glumes* imbricate on all sides adpressed concave scarcely keeled chestnut brown slenderly 3 5 nerved glabrous ½ 1 in *Stamens* 3 *Style* l arrow ly pyramidal base bran ermost cells small subquadrat *F monandra* F Mueller

9 **F. subtrabeculata,** *C B Clarke*, stem slender spikelet ellipsoid glumes ovate obtuse style 3 fid nut obovoid straw colrd smooth subtrabeculate

sides concave scarcely keeled brown 3 nerved paler on back *Style* long gla

xxxvii 12 (*excl* var *β*, *γ*, F Royeniana *and* American sp); *Benth Fl Austral* vii 310 (*excl some syns*) F pallescens, *Nees l c* 101, *Strachey Cat Pl Kumaon* 73, *Thw Enum* 348 Scirpus dichotomus, *Linn Sp Pl* 50, *Rottb Descr et Ic* 57, t 13, fig 1 S annuus, *Host Gram Austr* iii 42, t 63 (style wrongly 3 fid) S pallescens, *Roxb Fl Ind* i 229 —Fimbristylis, *Wall Cat* 3511, 3515, 3516 B, 3517 A

Throughout INDIA, alt 0–4000 ft , especially in rice fields —DISTRIB Warm regions of Old World

Annual, pubescent or puberulous *Stems* 2–10 in , tufted *Leaves* often as long as stem, narrow *Umbel* often 2–4 in diam , sometimes with 9–5 spikelets only, bracts often as long as umbel *Spikelets* ¼ by ⅛ in , somewhat angular from the acute keels to glumes *Glumes* boat-shaped, ferruginous, keel green 1–3 nerved, lowest empty more or less bract like often pubescent *Stamens* 2–1 (or 3 fide Boeckeler) ... is nearly to base *Nut* as long as ½ ... versely oblong, conspicuous, vertically ... —Closely allied to *F diphylla*, in ... much less keeled than in *F dichotoma*

15 **F. diphylla,** *Vahl Enum* ii 289, tufted, roots fibrous, leaves as long as ⅓–½ stem, umbel compound or simple or reduced to 1 spikelet, spikelets ovoid oblong terete, glumes glabrous, style 2 fid, nut 5–13- ... discolrd brown *Nees in Wight* ... xa, *Vahl Enum* ii 292 F ... & *in Nov Act Acad Nat Cur* ... *l c* 288 F annua, *Roem & Sch Syst* ii 95, and *Mant* ii 55, *Reichb Ic Fl Germ* viii. 44 F ... *Cyp* 116 F. brachy- ... 1 foliosa, *Link Hort* ... Royeniana, *Nees l c* 99 ... aipa, *Nees l c (partly)* ... 43) 77 (*partly*), *Benth* ... 234, *Strachey Cat Pl Kumaon*, 73 (*excl syns*) F Metzii, *Steud Syn Cyp* 127. F similis, *Steud Syn Cyp* 112 F spadicea, *Boeck in Flora*, xlii 70 (*not of Vahl*) F pentastachya, *Boeck l c* xl 36 & *in Linnæa*, xxxvii 17 F Heynei, *Boeck in Flora*, xlii 244 F polymorpha, *Boeck in Linnæa l c* 17 (*excl some syns*) F rigidula *Thw l c* 348 (*not of Nees*) Scirpus diphyllus *Retz Obs* v 15, *Roxb Fl Ind* i 227 S annuus, *Allioni Fl Pedem* ii 171, t 88, fig 5 S mil ... 224, 226, 227 ... curvifolia, *Schr* ... *Wall Cat* 3501,

Throughout INDIA, alt 0–6000 ft , common —DISTRIB All warm regions

Glabrous or hairy *Rhizome* none, or very rarely 0–1 in , stolons 0 *Stems* 1–24 in , striate, 3–5 angled (rarely compressed) under umbel *Leaves* linear or filiform, obtuse or acute, glabrous or hairy, never reduced to sheaths *Umbels* 1–8 in diam , bracts 3–4, sometimes short suberect, sometimes spreading much longer than umbel *Spikelets* commonly ⅙–⅓ in *Glumes* concave glabrous (rarely

limited here, this is one of the most widespread weeds in the world —The following varieties (among many others) have been esteemed species —

Var 1 ANNUA (sp) *Poem & Sel*, umbel with few (often with 3 1) ellipsoid obtuse spikelets —Common in Europe rare in Bengal

Var 2 DEPAUPERATA (sp) *Br*, stems very slender, flaccid, with few spikelets —C B Clarke (n 44119) from Assam, has a long slender stem, with a single lateral spikelet, overtopped by most slender leaves recedes from the type *F diphylla* more than does the Australian *F depauperata*

Var 3 PLURISTRIATA, var *C B Clarke* (*F pilosa* of most authors not of Vahl), sheaths and leaves often hairy, nut 10–16 striate on each face often verrucose or tubercular on shoulders —A very common southern, especially Malay form

Var 4 SPIROSTACHYS (sp) *F Muell*, large umbel large, spikelets large — In Australia but a Khasia form is equally large

Var NILAGIRICA rhizome very short creeping, stems 12 in in a close linear series, leaves filiform —Perhaps referable to *F stolonifera* Nilghiri Hills, Pykara, *King*

16 **F. stolonifera,** *C B Clarke* stoloniferous, spikelets dark chestnut, otherwise as *F diphylla* —Fimbristylis, *Wall Cat* 3503, A, B (*part*) C

KHASIA HILLS alt 2–5600 ft common MUNEYPOOR, *Watt* NEPAL or BENGAL, *Wallich*

Stolon breaking out horizontally from the base of stem, hardening into a long wiry rhizome clothed with lanceolate striate dusky scales *Stems* subsolitary, 1–2 ft, slender *Leaves* as long as $\frac{1}{4}$–$\frac{2}{3}$ stem, erect, very narrow, tip obtuse, hairy or glabrate *Umbel* nearly simple sometimes depauperated with few spikelets *Spikelets* ? by $\frac{1}{2}$ in

Var *lutens*, style branches 3 or 1 —Khasia, alt 6–7000 ft, *C B Clarke*

†††† *Nut obovoid smooth, reticulate (not conspicuously striate longitudinally)*

17 **F. æstivalis,** *Vahl Enum* ii 288, umbel compound or decompound spikelets ma[illegible] ovate acute submucronate style [illegible] straw colrd *Nees in Wight Contr* [illegible] *Trimen Cat Pl Ceylon*, 101 (*excl* [illegible] *ip* 110 F dichotoma, *Boeck in* [illegible] ns, *Miq Fl Ind Bat* iii 319 [illegible] 1 Scirpus æstivalis, *Retz Obs* [illegible] *Wall Cat* 3475 —Fimbristylis,

Throughout INDIA, alt 0–3000 ft (except the North west), abundant —DISTRIB S and E Asia, Australia and a var in America

[illegible]

quadrate hexagonal, arranged in 12–16 vertical rows on each face of nut, but far less prominent than in *F dichotoma*

18 **F. scaberrima,** *Nees in Wight Contrib* 102, stems middle-sized compressed under umbel, leaves and bracts long, umbel compound

25 **F. rigidula,** *Nees in Wight Contrib* 99, rhizome horizontal woody short, leaves longish, umbel once or twice compound spikelets very obtuse solitary and paired style 2 fid, nut obovoid smooth dirty straw colrd F Hanceana, *Boeck in Linnæa* xxxviii 394 —Fimbristylis, *Wall Cat* 3519 (*partly*)

From KUMAON, alt 0–6000 ft to Bengal *C B Clarke* MUNEYPOOR, *Watt*, SHAN HILLS, *Collett* —DISTRIB China Phil ppines

Stems 4–16 in, thickened at base closely 1–seriate on rhizome *Leaves* as long as ½ culm, glabrous or (with their sheaths) pubescent, tip subobtuse *Umbel* 1–5 in diam, somewhat lax, bracts short *Spikelets* ⅕–½ in ellipsoid or subglobose Nu
ser

—

He
Nees

26 **F. spathacea,** *Roth Nov Pl Sp* 24, leaves short rigid umbel ...acted sometimes subcapitate, obovoid smooth or somewhat ...ight *Contrib* 99, *Thw Enum* 349 F glomerata, *Nees in Linnæa* ix ...90 *Boeck in Linnæa* xxxvii 47 F rigida *Kunth Enum* ii 231 F ciliolata *Steud Syn Cyp* 109 F capitata, *Zoll Verz Ind Arch p* ii 61 (*not of Br*) F lævissima, *Steud l c* 117 F junciformis, *Munro in Seem Bot Voy Herald* 422 (*not of Kunth*) F biumbellulata *Boeck in Flora*, xli 604 (see xlii 34) Scirpus glomeratus, *Retz Obs* iv 11 (*not of Roxb*) S strictus *Roxb Fl Ind* i 226 —Cyperus *Wall Cat* 3300 (*partly*)

From SIND and ORISSA to CEYLON and SINGAPORE —DISTRIB Warm regions

Stems 4–16 in, tufted rigid *Leaves* as long as ¼ stem (often much shorter), narrow, glabrous margins incurved *Umbel* 2 in diam in well developed examples, usually somewhat dense with solita... developed examples the sp kelets are...

..., Boeckeler appears only and to have placed it (on ...gma group of *F cymosa*,

Series B Spikelets or some of them clustered (See also *F spathacea*, *F rigidula*, and occasionally *F diphylla* in series A, B)

* *Stems with only one head*

... F. ... ...94, stems leafy at base, spikelets scarcely acute, style 2 fid, nut ...ansversely wavy lined *Nees in* ...mb *Fl* 287, *Thw Enum* 348, *Boeck in Linnæa* xxxvii 8 Scirpus argenteus, *Rottb Descr et Ic* 51, t. 17, fig 6, *Roxb Fl Ind* i. 223 S monander, *Rottb Descr et Ic* 50 t 14 fig 3 (*not of Roxb*) —Isolepis, *Wall Cat* 3483 —*Rheede Hort Mal* xii t 54

From BENGAL and CENTRAL INDIA to CEYLON —DISTRIB Mauritius, fide Boeckeler

stem 0, spikelets *lets* 4–20 in the *Glumes* ovate, ian nut, nearly long as glume, biconvex, almost margined, outer cells obscure

28 **F. albicans,** *Nees in Wight Contrib* 100, stems leafy at base, spikelets ellipsoid rusty grey, glumes scarcely acute, style 2-fid, nut obovoid straw colrd. smooth transversely minutely trabeculate *Boeck in Linnæa*, xxxvii 9 — Isolepis, *Wall Cat* 3482

DECCAN PENINSULA, *Wight, Wallich*

Nearly glabrous *Stems* 8–14 in, slender *Leaves* narrowly ligulate, tip suddenly narrowed acute *Spikelets* 4–15 in the head $\frac{1}{4}$ by $\frac{1}{6}$ in *Stamens* often 2 *Style* longer than nut, slender, glabrous, with long linear branches *Nut* small, shining, outermost cells conspicuous, transversely oblong, not accurately superimposed in vertical series (so that the nut is scarcely striated longitudinally) — Otherwise as *F argentea*

** *Clusters of spikelets subumbellately corymbed.*

29 **F. Hookeriana,** *Boeck in Linnæa*, xxxvii 22, nearly glabrous, spikelets clustered and solitary linear lanceolate, style 2 fid, nut obovoid yellow-brown squamose tuberculate.

KHASIA HILLS, alt 1500–4000 ft CHOTA NAGPORE, alt 2000 ft *Clarke*

Annual *Stems* 4–10 in, tufted, compressed *Leaves* often as long as stem, narrow, flat *Umbel* often 4–6 in diam, branches oblique erect, bracts like the leaves, often overtopping umbel *Spikelets* 1–6 in a cluster, $\frac{1}{4}$ by $\frac{1}{12}$–$\frac{1}{10}$ in, terete ... incurved, rusty- ... e longer than nut, ... length, deciduous ... shortly stalked; outer cells transversely-oblong, regularly superimposed in 1_–15 vertical series in each face (i e nut slenderly longitudinally 12–15 ribbed); shoulders of nut subtuberculate by small scales or papillæ

30 **F. sericea,** *Br Prod* 228, leaves numerous, white silky strigose beneath, spikelets ellipsoid oblong silvery grey, style 2-fid, nut obovoid smooth pale *Boeck in Linnæa*, xxxvii 22 F decora, *Nees & Meyen in Wight Contrib* 101. F dasyphylla, *Miq Fl. Ind Bat* iii. 327 F. velutina, *Franch in Bull Soc Bot France*, xxvi. 87

ORISSA, Poori, *W S Atkinson*, Ganjam, *Lawson* SINGAPORE, *Ridley* — DISTRIB E Asia, Malaya, Australia

... sometimes divided, ... as long as $\frac{1}{4}$–$\frac{1}{2}$ ... or compound; ... densely-flowered. ... purple-green, ... about as long as *Nut* as long as

... lowest ... eral ..., the

Series C Spikelets all (or nearly all) solitary.

* Stem with few (*sometimes* 3-1) spikelets

31 **F. tenera,** *Roem & Sch Syst* ii, *Mant* 57, stems 8-12 in. slender, umbel lax subcompound, spikelets ellipsoid ultimately cylindric lanceolate, glumes ovate acuminate submucronate glandular puberulous, sty

Bo

554

in

DECCAN PENINSULA, *Wight* —DISTRIB Trop Africa

Roots fibrous *Stems* tu

Nut as long as ⅓ glume,

Wight

Var *oxylepis* (sp) *Steud Syn Cyp* 110, glumes glabrate, nut verrucose yellow brown F glabra *Steud l c* 111 Fimbristylis, *Wall Cat* 3514 B, E, partly 3531 —From Lahore and Bengal to Madras

Var ? *obtusata* leaves numerous 1/12 in broad obtuse glumes glabrate not mucronate nut verrucose yellow brown (spikelets sometimes clustered) —Lower Bengal, *Wallich Kurz* Singapore, *Ridley* —Borneo

32 **F. monticola,** *Steud Syn Cyp* 111, glabrous, stems 6-14 in slender, umbel lax simple or hardly compound, spikelets oblong lanceolate, glumes ovate acute style 3 fid, nut broadly obovoid brown slightly tubercled. F tenuifolia, *Thw Enum* 434—Fimbristylis, *Wall Cat* 3514 A

SOUTH MADRAS and CEYLON, Cannanore, *Campbell* NILGHIRI HILLS *Hohenacker* ANAMALLAYS *Beddome*

Umbel 1 in in diam, with

it as long as ½-⅓ glume, acutely

-15 irregular vertical series —

33 **F. merguensis,** *C B Clarke*, stems 1 ft rather slender leaves several short, umbel once compound spikelets largeish lanceolate style 3 fid, nut small obovoid straw colrd smooth F Thwaitesii, var *Boeckms* Trichelostylis sp, n 21, *Herb Ind Or H f & T T*

MALAY PENINSULA Mergui, *Griffith*, Tenasserim, *Helfer* (*Kew Distrib* 6330)

Glabrous *Roots* fibrous *Stems* tufted, obscurely 3-4 angular under umbel

Nut as long as ½ glume trigonous, minutely mucronate

34 **F. Pierotii,** *Miq in Ann Mus Lugd Bat* ii 145, stoloniferous,

once compound,

ooth or somewhat

sp, n 20, *Herb*

N W HIMALAYA, alt. 4–9000 ft. SIMLA, *T. Thomson*, *Gamble* KUMAON, *Duthie* —DISTRIB Japan

Stolons up to 2 in, densely clothed by lanceolate striate scales, finally hardening into a woody rhizome *Leaves* as long as ½ stem, flat, acute. *Umbel* 1 3 in. in diam, with 5–14 spikelets, bracts short *Spikelets* ¼ by ⅛ in, ellipsoid-lanceolate, 10-fid *Glumes* adpressed, boat-shaped, ovate, shortly acuminate, chestnut or testaceous, usually with round glands in upper half, margins scarious *Style* long, glabrous, deciduous with narrow style-base *Nut* as long as ⅓–⅖ glume, tip sub pyramidal

** Stem with many spikelets (at least in fairly developed examples)

† *Nut slenderly trabeculate (outermost cells transversely oblong).*

35 **F. Arnottiana,** *Boeck in Linnæa*, xxxvii. 28, stems a foot (at least), umbel decompound, spikelets cuboid-ellipsoid one-colrd, glumes ovate obtuse brown hardly keeled, style 3-fid, nut obovoid yellow-brown transversely lineate obscurely tuberculated

DECCAN PENINSULA, Cannanore, *Campbell* (*Herb Wight* propr, n 1884, *right-hand plant only*)

Stems somewhat slender, 4–5-angular under umbel *Umbel* 3–4 in diam, glabrous, with 30 spikelets, bracts 3–4, up to ⅔ in long, very narrow *Spikelets* ⅕ by ⅙ in, obtuse, 10 fid, styles conspicuously protruded *Glumes* concave, ad-

[illegible]

is closely allied

36 **F. filifolia,** *Boeck in Linnæa*, xxxvii. 32, stems 2 ft quadran-

[illegible]

SIKKIM TERAI, Dulkajhar, alt 500 ft, *C B. Clarke* KHASIA HILLS, Churra, alt 4200 ft, *J D H* &c

[illegible]

37 **F. asperrima,** *Boeck in Linnæa*, xxxvii 40, stems 1½–2½ ft, leaves long, umbel decompound with numerous spikelets, bracts acute often longer than umbel, style 3 fid, nut ellipsoid brown smooth transversely trabeculate smooth or slightly tuberculate F chætorrhiza, *Thw. Enum* 349 (*partly, not of Kunth*) Isolepis dura, *Moritzi, Verz. Zoll Pl* 97 Trichelostylis asperrima, *Nees ms* —Fimbristylis, *Wall. Cat.* 3502 B (*partly*), 3525 (*mixed*)

CEYLON, *Thwaites*, &c From TAVOY, *Wallich*, to SINGAPORE, *Ridley*, frequent.

[illegible]

as ... several, often as long ... *Spikelets, style,* and

nut much as in *F complanata* (but nut more trabeculate) —Much resembles larger forms of *F complanata*, Link, but differs by the long bracts The Khasia plants referred here by Boeckeler were perhaps *F Thomsonii*, Boeck

38 **F. quinquangularis,** *Kunth Enum* ii 229, stems 8–24 in leafy at base or leafless, umbel decompound or supradecompound, spikelets small ellipsoid lanceolate 6–14 fid, style 3 fid, nut obovoid transversely lineolate pale or brownish more or less tuberculate *Thw Enum* 349, *Dalz & Gibs Bomb Fl* 287 *Boeck in Linnæa*, xxxvii 42 (excl F Salbundia) F Salbundia, *Boeck in Linnæa* xxxvii 44 (*mostly, not of Kunth*) F angularis, *Steud Syn Cyp* 116 F Boeckeleri, *Steud l c* 113 (*partly, see Boeck in Flora*, xlii 69) F tenera, *Boeck l c* 111 (*not of Roem &* ... ii 279 *Roxb Fl Ind* ... S pentagonus, *Roxb l c* (*not* F Salbundia, *Kunth*) *Contrib* 104 Isolepis angularis and I ? pentagona *Roem & Sch Syst* ii, *Mant* 69 —Fimbristylis, *Wall Cat* 3499, 3512 (*mainly*)

... on, and MALAY PENINSULA —DISTRIB

Stems usually flattened at base with ... ider umbel *Leaves* often as long as ½ ... often 4–8 in in diam with 100 spike ... an usual), bracts ½ 1½ in *Spikelets* ⅛–¼ in long more acute than in *F miliacea* subterete (not polygonal as in *F* ... ed *Style* longer than nut ... with the narrow pyramidal ... ime —Hardly separable from

... t leafless or ... *Syn Cyp* ... n, *Thwaites*

39 **F. miliacea,** *Vahl Enum* ii 287, stems 8–24 in, leafy at base or (rarely) leafless, umbel decompound or supradecompound, spikelets small globose (or ultimately cylindric) obtuse many-fid, style 3 fid, nut obovoid transversely lineolate pale or brownish more or less tuberculate *Thw Enum* 348, *Dalz & Gibs Bomb Fl* 287, *Miq Fl Ind Bat* iii 3... *Bot* ... flacci ... *Zoll* ... t 9 ... *Poir* ... 68 ... *Pres* ... gona ... 3524

Throughout INDIA, alt 0–6000 ft, abundant —DISTRIB All warm regions

Hardly separable from *F quinquangularis*, but by the obtuser spikelets Outer cells (transverse) of nut translucent, appearing themselves longitudinally striolate

†† *Nut smooth verrucose or tubercular, not trabeculate*

40 **F. globulosa,** *Kunth Enum* ii. 231, stems 8–16 in, top sheath

leafless, spikelets cuboid ellipsoid obtuse glumes obtuse, style 3 fid (see var β) nut obovoid verrucose pale brown *Thw Enum* 349, *Boeck in Linnæa*, xxxvii 45 F umbellaris, *Vahl Enum* ii 291 F efoliata, *Steud Syn Cyp* 109 Scirpus umbellaris, *Lam Ill* i 141 S globulosus, *Retz Obs* vi 19 Isolepis globulosa, *Roem & Sch Syst* ii 119 Trichelostylis globulosa, *Nees in Wight Contrib* 105—Fimbristylis, *Wall Cat* 3518, 3529

CEYLON, *Thwaites* From NEPAL *Wallich* ASSAM, *Griffith*, and SHAN HILLS *Collett* to PENANG *Wallich*—DISTRIB Malaya, Tonkin, Polynes

Glabrous *Rhizome* none or scarcely any *Stems* tufted, 4–5 angular under umbel Lower *sheaths* bearing long leaves or leafless *Umbel* sometimes 2 in diam, with 20 spikelets, often smaller, sometimes with 2–1 spikelets, bracts rarely ½ in *Spikelets* ¼ by ⅙ in, dense fld dusky brown *Glumes* concave, incurved, 3 nerved *Stamens* often 2 *Style* as long as nut, deciduous with the narrowly

[illegible]

n 16 *Herb Ind Or H f & T*—Banks of the Chenab *Thomson*, Dehra Doon, *Vicary*

41 **F.** [illegible]

Obs)

CEYLON, *Thwaites*—DISTRIB Borneo China

Glabrous *Rhizome* short descending *Stems* obscurely 4–5-angular under umbel *Leaves* several as long as ½ stem narrowish, flat, tip suddenly narrowed *Umbel* 1½ 3½ in in diam sometimes simple with 4–5 spikelets, bracts 2–3, less [illegible]

42 **F. pentaptera,** *Kunth Enum* ii 229, stems 16–36 in leafless [illegible] ...ts small, ... *Boeck* ... *nth*) S ... 3) Tri-

Ceylon, up to 6000 ft, *Gardner*, *Thwaites* Deccan Peninsula, *Wight* (n 2901, in *Herb Calcutt*)

Rhizome short, horizontal, woody *Stems* somewhat thickened at base, sheaths hard, yellow brown *Umbel* 2–5 in in diam, with sometimes 40–80 spikelets *Spikelets* ¼ by 1/12 in, chestnut-colrd *Glumes* adpressed, ovate, scarcely acute *Stamens* often 2 *Style* long, glabrous deciduous with the narrowly pyramidal style-base *Nut* as long as ½ glume—Easily recognized by the hairy stem

43 **F. complanata,** *Link Hort Berol* i 292, stems 8–24 in flattened under umbel, leaves almost premorse, style 3 fid nut minute obovoid pale more or less tuberculate *Thw Enum* 319 F autumnalis var, *Roth Nov Pl Sp* 26, *Boeck in Linnæa*, xxxvii 38 F scabra, *Kunth Enum* ii 245 F Boeckeleri *Steud Syn Cyp* 113, partly Scirpus complanatus, *Retz Obs* v 14, *Roxb Fl Ind* i 228 S anceps, *Willd in Berl Mag* ii 288, t 8, fig 2, *Roxb l c* 230 Cyperus complanatus, *Willd Sp Pl* i 270 Isolepis complanata & Willdenowii *Roem & Sch Syst* ii 119, 120 Trichelostylis complanata & T scabra *Nees in Wight Contrib* 103—Fimbristylis, *Wall Cat* 3502 A, 3510, 3525 (*partly*)

Throughout INDIA in the warm region —DISTRIB All warm regions

Glabrous. *Rhizome* hardly any, sometimes very short horizontal *Leaves* often 4–8 by ⅛ in *Umbel* often 4 in in diam, compound and supradecompound, sometimes with 160 spikelets, bracts 2, shorter than umbel (often suberect) similar to leaves almost premorse *Spikelets* ¼ by $\frac{1}{12}$ in *Stamens* usually 3 *Style* longer than nut, glabrous, branches linear, long *Nut* about ⅓ length of glume, outer most cells short oblong transverse, in vertical series but obscure (i e nut scarcely striate)

Var *microcarpa* (sp), F Muell Fragm Phyt Austral i 200, stems slender hardly flattened under umbel spikelets more slender nut very small velate (i e outermost cells withering and partly peeling off) *Benth Fl Austral* vii 316 ... not of *Roem & Sch*) — ... ikkim alt 9500 ft, J D H

... *complanata*, Link and F

Var *Kraussiana*, (sp) Hochst in Flora xxviii 757 stems slender obscurely flat tened under umbel, umbel more compact less compound often with 10–30 spikelets F connectens *Thw Enum* 349 —Ceylon, *Thwaites* —China, Malaya Afric

Var *fenestrata* spikelets larger rusty brown glumes large laxly subpatent ... strongly reticulate persistent outermost ... ht (n 2899) —Roots fibrous *Stems* 12– ... *Leaves* as long as ⅔ stem ⅛ in broad, ... in *F complanata*, typ *Spikelets* ⅜ by

44 **F. Thomsonii,** *Boeck in Linnæa*, xxxvii 37, stems 8–24 in, leaves flat tip obtuse, umbel compound and supradecompound, spikelets ellipsoid acute, style 3 fid, nut oblong obovoid straw colrd verrucose or subtuberculate obscurely transversely lineolate F complanata *Benth Fl Hongk* 393 —Trichelostylis, sp n *Herb Ind Or H f & T*

N E INDIA, alt 600–4000 ft, from SIKKIM ASSAM and Chota Nagpore to ...

... **F. ...** ... 1½–3 ft l afless 4–5- ... s spikelets glumes ... opaque smooth or ... in *Wight Contrib*

105 (*at least in part*) not Scirp Salbundius *Ham in Wall Cat* n 3499 A. nor F Salbundia, *Boeck*) —Fimbristylis *Wall Cat* 3499 C in Herb Berlin (*not in Herb Linn Soc*) 2526 3527 (*in Herb* DC *not in Linn Soc*)

SILHET, *Wallich* KHASIA HILLS, *Griffith* AMHERST, *Wallich* n 3527 (*in Herb DC*) —DISTRIB Australia.

Glabrous *Rhizome* very short, obliquely descending *Stems* tufted acutely angular *Umbel* 2–4 in diam , bracts scarcely an inch bristle like *Spikelets* $\frac{1}{8}$–$\frac{1}{6}$ in , angular, about 10 fid *Glumes* ovate obtuse margins broadly scarious —Has been greatly confused with the leafless form of *F quinquangula* is from which it is easily known by the testaceous spikelets polygonal by reason of the acutely keeled glumes

Series D Spikelets clustered (some solitary often added)

46 **F. leptoclada,** *Benth Fl Hongk* 393 (not Fl Austral), stems 1 foot slender, leaves long narrow spikelets small in 1 3 small clusters dark brown glumes very obtuse tip ciliate style , fid nut obovoid yellow brown verrucose F retusa *Thw Enum* 349 *Boeck in Linnæa*, xxxvii 46, *Hance in Lond Journ Bot* xvi 112

CEYLON *Thwaites* MALACCA, *Griffith* —DISTRIB Borneo China

Annual glabrous *Leaves* as long as $\frac{1}{2}$ stem (or all stem) $\frac{1}{12}$–$\frac{1}{12}$ in broad [illegible] racts hardly $\frac{1}{3}$ in *Spikelets* usually [illegible] *Style* as long as nut glabrous deci[illegible] branches linear *Nut* as long as $\frac{2}{5}$

47 **F. paupercula,** *Boeck in Linnæa*, xxxviii 396 stems 1 ft slender clusters of spikelets in a simple umbel, style 3 fid, nut obovoid with many longitudinal striations finally black

DECCAN PENINSULA Pulney Mts , *Wight* (n 2896)

Nearly glabrous *Rhizome* short obliquely descending *Stem* under umbel 5 angular minutely scabrous pilose *Leaves* as long as $\frac{1}{2}$ stem narrow *Umbel* rays 4–5, 1 in long bracts hardly $\frac{1}{2}$ in *Spikelets* 2 7 to a cluster $\frac{1}{5}$ in long ellipsoid brown about 6 fid *Glumes* ovate keel slightly excurrent as a mucro glandular upwards sometimes puberulous *Nut* as long as $\frac{1}{3}$ glume triquetrous apex obtuse ; outer cells shortly transversely elliptic regularly arranged in about 16 vertical series on each face —This is in Herb Calcutt Paris and Berlin , but not in Mus Brit or Kew

48 **F. junciformis,** *Kunth Enum* ii 239, stems 4–16 in , leaves several rigid umbel compound and decompound spikelets clustered style 3 fid nut obovoid nearly smooth or verrucose straw colrd or pale brown *Boeck in Linnæa* xxxvii. 49 F Hænkei *Dietr Sp Pl* ii 161 F chætorrhiza *Kunth l c* 240, *Strachey Cat Pl* ii 73 F falcata *Kunth l c* 239 Scirpus falcatus *Vahl Enum* ii 275 Isolepis falcata *Roem & Sch Syst* ii 118 Trichelostylis junciformis and chætorrhiza *Nees in Wight Contrib* 106 —Fimbristylis, *Wall Cat* 3519 (*partly*) 3520

spikelets in the typical form, but examples with many solitary few clustered spikelets occur, ⅛–¼ in, brown or chestnut colrd, many fld Glumes ovate, obtuse, ...le longer than nut, slender, ...he small pyramidal style base, ...bscurely) striate —F Haenkei, ...ecies The Californian habitat

Var *abbreviata* (sp) Boeck in Flora, xli 601, spikelets some paired but mostly solitary F chætorrhiza, *Thw Enum* 349 (*partly*) —Ceylon, *Thwaites, Gardner* Deccan Peninsula, *Wallich* n 3520 A (*partly*) Anamallay Mts, *Beddome*

Peninsula, *Wight, Wallich* Ceylon, *Walker*

49 **F. nigrobrunnea,** *Thw Enum* 434, stems 8–20 in, leaves several stout obtuse, umbel simple compound or decompound, spikelets

KHASIA HILLS, alt 3–5000 ft MUNEYPOOR, alt 3500 ft, *Watt* DECCAN PENINSULA, Courtallum, *Wight* NICOBARS CEYLON, *Thwaites*, &c —DISTRIB Cambodia

Glabrous *Rhizome* hardly any *Leaves* as long as ⅓–⅔ stem, by ⅛ in broad ... the common Khasia form 2–10

50 **F. uliginosa,** *Steud Syn Cyp* 109, stems 4–8 in slender, leaves almost bristle like, spikelets clustered black chestnut, style 3 fid, nut obovoid smooth pale slightly narrowed at top *Boeck in Linnæa*, 25, 25

NILGHIRI HILLS, alt 6–7000 ft, *Perrottet*, &c

Leaves as long as ⅓–½ stem, $\frac{1}{30}$–$\frac{1}{12}$ in broad *Umbel* simple or often reduced to a single cluster sometimes to a single spikelet —Otherwise as *F. nigro brunnea*, Thw, of which this may be a small mountain state

51 **F. digitata,** *Boeck in Flora*, lxi 35, stems 2–5 in bristle like base bulbous, spikelets 3–8 straw colrd in a subterminal head, style 3 fid nut obovoid smooth straw-colrd or finally brownish *Benth & Hook f Gen Pl* iii 1050 Scirpus Lawianus, *Boeck in Linnæa*, xxxvi 479 *Trichelostylis digitata*, *H f & T ms*

BOMBAY, *Dalzell* CANARA, *Law, Young*, Belekerri *Talbot*.

Glabrous. *Leaves* as long as ½ stem bristle-like *Bracts* 2–1, shorter than head *Spikelets* ¼ ⅓ by $\frac{1}{12}$ ⅛ in, 6–18-fld *Glumes* ovate-oblong, scarcely acute, keeled, chaffy, nearly 1-colrd *Style* nearly as long as nut, glabrous, deciduous, with small pyramidal style base, branches linear *Nut* as long as ½ glume, sessile, round-trigonous, obtuse at top

Sect IV ABILDGAARDIA (Genus) *Vahl Enum* ii 296 Lower glumes of spikelet distichous or nearly so, upper fertile glumes spirally placed (See also F *nigrobrunnea* sp n 49 above) Spikelets not clustered

* *Spikelets pale, nut large triquetrous base much narrowed*

52 **F. monostachya,** *Hassk Pl Jav Rar* 61, stems leafy at base with 1 (rarely 2–3) spikelet, nut bearing glumes 2–3 stichous shortly [illegible]

[illegible]

Enum [illegible], *Boeck in Linnæa* xxxvii [illegible] A lævigata, *Link Jahrb* iii 81 A Rottboelliana, *Nees in Wight Contrib* 95 A compressa, *Presl Rel Hænk* i 179 A indica, *Nees in Linnæa*, ix 289—Abildgaardia *Wall Cat* 3491

[illegible]

Lea[illegible] [illegible] [illegible]ate, acute, keel green sides [illegible]ng not crested *Style* long, [illegible] style base, branches rather [illegible]

53 **F. tristachya,** *Thw Enum* 434 (*not of Br or Nees*), stem stout leafy at base with 2–5 (rarely 1) large spikelets, nut bearing glumes 2–3 stichous shortly mucronate style 3 fid nut large obovoid tuberculate ultimately brown black Cyperus triflorus, *Linn Mant* 62 Schœnus cyperoides *Retz Obs* iv 8 Abildgaardia tristachya, *Vahl Enum* ii 297, *Nees in Wight Contrib* 95 *Thw l c* 347, *Boeck in Linnæa*, xxxvii 54 A monostachya, var *Hassk Pl Jav Rar* 61—Isolepis? *Wall Cat* 3492

DECCAN PENINSULA, frequent, *Wight*, &c CEYLON, *Thwaites*—DISTRIB Warmer Africa

Stems 1–2½ ft *Leaves* as long as ½ stem, rigid *Spikelets* 1 in compressed, often twisted —This species is altogether larger than the common forms of *F monostachya*, from the large form of *F monostachya* it does not differ much except by its dark nut.

** *Spikelets brown, nut small base not much narrowed*

54 **F. fusca,** *Benth in Gen Pl* iii 1048, leaves several short flat, umbel often compound bracts short, glumes few ranked boat-shaped acute brown puberulous, style 3-fid, nut obovoid pale smooth slightly verrucose F cinnamometorum, *Hance in Journ Linn Soc* xiii 132 (*not K* [illegible] *hrb* v 585 Gussonia [illegible] Abildgaardia fusca [illegible] vii 54 A pauciflora, *Kunth Enum* ii [illegible] Schœnus puberulus, *C A Meyer Cyp Nov* 2 t 1 Rynchospora? anomala *Steud Syn Cyp* 149, *Miq Fl Ind Bat* iii 337 Isolepis longispica, *Steud l c* 104—Fimbristylis, *Wall Cat* 3530

Sch Syst Mant ii 533 I capillaris, *Don Prodr* 39 (*not Roem & Sch*) I Cumingii and I involucellata, *Steud Syn Cyp* 101 I subtristachya, *Hochst*, see *Boeck l c* 752 Fimbristylis monandra, *Roem & Sch Syst Mant* ii 59 F barbata, *Benth Fl. Austral* vii 321—*Burm Thes Zeyl* t 47, fig 2—Isolepis, *Wall Cat* 3481, 3497

Throughout INDIA, alt. 0–4000 ft, from KASHMIR and ASSAM to CEYLON and SINGAPORE—DISTRIB Warm regions

[illegible]

Var *pulchella* (sp) Thw Enum 350 (under *Isolepis*), lower glumes ovate-lanceolate longer more rigid than in *B barbata* type. Scirpus Thwaitesii, *Boeck in Linnæa*, xxxviii 380,—Isolepis, *Wall Cat* 3480, B 3481 C—South Madras Pondicherry, *Perrottet*, Tuticorin *Wight* n 2891, *Wallich* Ceylon, *Thwaites* n 829 3761), &c—The type form of this var looks a separable species but there are intermediates which I cannot sort between the two, Wight regarded all as one species

2 **B. subspinescens,** *C B Clarke*, stem hairy with about 10 spikelets in an almost prickly head, style 3 fid, nut pale brown

ORISSA, Poori, *W S Atkinson, Clarke*

Whole plant pubescent. *Stems* 4 in, rigid, curved *Leaves* as long as ⅓ stem *Spikelets* nearly ¼ in, hard almost stellately spreading, bracts about as long as the head *Glumes* scarcely keeled, densely pubescent—Otherwise as *B barbata*, of which it might be treated as a var growing in sea sand.

3 **B. capillaris,** *Kunth Enum* ii 212 (see p 205), stem glabrous, spikelets nearly all solitary in a simple or compound umbel, style 3 fid, nut pale transversely undulate Scirpus capillaris, *Linn Mant* 321

Throughout AMERICA

Var *trifida* (sp) *Kunth Enum* ii 213, nut smooth or often verrucose not transversely undulate Scirpus densus, *Wall in Roxb Fl Ind* (ed Carey & Wall) i 231 S gracillimus, *Boeck in Linnæa* xxxvi 761 S trifidus *Hance in Journ. Bot* xvi 112 Isolepis trifida, *Nees in Wight Contrib* 108, *Strachey Cat Pl Kumaon*, 73, *Thw Enum* 350 I tenuissima, *Don Prodr* 40 I densa, *Roem & [illegible] Sen Cyp* [illegible] F capil [illegible] —Isolepis, [illegible]

Very common from the HIMALAYA, alt 0–8500 ft, to CEYLON—DISTRIB Warm regions of Old World.

[illegible] *Leaves* as long as [illegible] ke hairs at least in [illegible] umbel very com [illegible] ith 3 or not rarely [illegible] developed

4 **B. puberula,** *Kunth Fnum* ii 213 (see p 205), stem pubescent or

puberulous under umbel umbe
solitary style 3 fid nut pale
Poir Encycl vi 767 *Boeck*
Boeck l c 765 (*in great part*) … barbatus, *Boeck l c* 767 (*as to syn*
Isolepis gracilis and Thwaites n 834) I gracilis, *Nees in Wight Contrib*
109 (*not Linnæa* x 161) *Kunth l c* 217, *Thw Enum* 350 I puberula
Steud Syn Cyp 103 Cyperus pubescens, *Steud l c* 50

DECCAN PENINSULA *Wight* CEYLON *Thwaites* n 834 MERGUI, *Griffith* MALACCA *Kunstler* SINGAPORE *Burbidge*—DISTRIB Trop Africa, Malaya and Cochin China

Very near *B capillaris* the spikelets are really solitary, but often closely packed in an umbel less than 1 in diam In Wight n 1892 (type of *Isolepis gracilis* Nees) the stems are long very slender the umbel is lax some pedicels ½ in long

10 SCIRPUS, *Linn* (*partly*)

Herbs of very …
hairy) *Spikelets*
sometimes few fld
Glumes 1–2 (rarely
perfect nut-bearin …
setaceous or 0, or (in *S littoralis* and *S Isolepis*) sometimes broad ovate *Stamens* 3–1, anterior anthers linear oblong or oblong crested or unappendaged. *Style* long or short glabrous, 3 fid or 2 fid base linear or linear conic, continuous with apex of nut *Nut* trigonous or plano convex, sessile or nearly so —Species 125, all regions

This genus here includes (in several very dissimilar sections) all the scirpoid species left after the neighbouring genera have been taken out *Eleocharis* and *Fimbristylis* differ by the enlarged style base (separated from the nut by a constriction or a line), *Fuirena* and *Bulbostylis* have hairy leaves, *Eriophorum* has bristles ligulate, laciniate (to the base in the Indian species)

Sect I MONOSTACHYI Small or slender Stems (or branches) with one spikelet Style long

1 S fluitans, *Linn Sp Pl* 71, stem weak elongate branched leafy upwards, bristles 0, style 2 fid nut plano convex obovoid smooth pale *Reichb Ic Fl Germ*
in Linnæa, xxxvi 485 (*exc*
Prodr 221, *Thw Enum* 3
vata, *Zoll Verz Ind Archi*,
i 284 E curvulus, *Nees in*

KHASIA HILLS, alt 1–3000 ft NILGHIRI HILLS, *Perrottet*, &c, with more rigid purple glumes (var *spadicea*) CEYLON, *Thwaites*, &c, with shortened curved nodes and clustered peduncles and leaves (var *curvula*)—DISTRIB Nearly all regions

Root fibrous *Stems* 2 12 in long flaccid, in water or on mud *Leaves* ½–2½ in, very narrow *Peduncles* 1–4 in *Spikelet* $\frac{1}{10}$–⅓ in, many- or few fld.; bract usually shorter than the spikelet, or 0 *Glumes* ovate, obtuse, concave *Nut* as long as ½–⅔ glume, outermost cells small quadrate hexagonal obscure (i e nut smooth or obsoletely reticulate)

2 S. submersus, *Sauvalle Fl Cuba*, 175, stem weak elongate branched leafy upwards bristles 6 overtopping nut, style 2 fid, nut (only

Br Prod 221, *Nees in Wight Contrib* 107, *Miq Fl Ind Bat* iii 309 Schœnus junceus, *Willd Phyt* i 2 t 1, fig 4—Scirpus, *Wall Cat* 3461

Throughout INDIA and CEYLON (except Assam), alt 0 3000 ft—DISTRIB Old World generally, and in America

Roots fibrous *Stems* 2–12 in *Leaves* short usually less than an inch *Head* of 7–1 spikelets quasi lateral, lowest bract as though a continuation of the stem, 1–4 in, terete, channelled (not triquetrous) *Spikelets* $\frac{1}{5}$ $\frac{1}{4}$ in, many fld, sub pentagonous *Nut* as long as half glume, acutely triquetrous, or slightly compressed

Var *uninodis* heads umbellate on 3 1 rays rarely so much as 1 in S mucronatus, *Roxb Fl Ind* i 216 (*not of Linn*) Isolepis uninodis, *Delile Fl Egypt* 8, t 6 fig 1 I. ambigua, *Zoll Syst Ver Ind Archip* ii 62 (*not of Steud*) I oryectorum *Steud Syn Cyp* 96—SIND *Pinwill* BENGAL, *Wallich* J D H COROMANDEL *Roxburgh*, *Wight* CEYLON, *Leschenault*, *Macrae*—DISTRIB Trop Africa, Java Austral

5. [illegible]

Throughout INDIA with CEYLON, alt 0–3000 ft—DISTRIB Temp Asia and N Am Austral

This species united with *S supinus* by Boeckeler has been again separated by Bentham l c on the characters of the bristles, style branches and nut The two appear amply distinct, *S supinus* has carinate glumes and angular spikelets *S erectus* has concave glumes and terete spikelets

[illegible] stems medium terete spongy [illegible] e head, glumes ovate acute, [illegible] rous faintly transverse wavy [illegible] *et Ic* 53, *Roxb Fl Ind* i [illegible] losus, *Forsk Fl Ægypt Arab* [illegible] d *Suppl* v 91 S incurvatus [illegible] 15 Isolepis articulata *Nees* [illegible] *Dalz & Gibs Bomb Fl* 286 [illegible] haris [illegible] in- [illegible] *Wall* [illegible]

[illegible] CEYLON and MOUL [illegible]

[illegible] hen dry) transversely [illegible] similar to the stem, [illegible] *Spikelets* $\frac{1}{4}$–$\frac{1}{2}$ in long [illegible] ur *Glumes* slightly [illegible] *Stamens* usually 3

Style slender, branches 3, long *Nut* nearly half as long as glume, almost symmetric-trigonous, faces concave.

10. **S. quinquefarius,** *Ham in Wall Cat* 346?, stems medium or slender terete nearly leafless, spikelets 1–9 in a single lateral dense head, glumes broadly ovate acute inflated in fruit, bristles 0, style 3-fid, nut obovoid triquetrous faintly transversely wavy black. *Boeck in Linnæa,* xxxvi. 701 Isolepis lupulina *and* I. Roylei, *Nees in Wight Contrib* 107

NORTHERN INDIA, from RAWUL PINDEE, *Aitchison,* SIND, *Pinwill,* and CENTRAL INDIA, *King,* to ASSAM, *Wallich & Griffith* —DISTRIB Turkestan, Cabul, Transvaal

Root fibrous *Stems* 2-12 in, often (when dry) transversely septate *Spikelets* shining straw-brown *Glumes* many ribbed, sometimes laxly spiral, sometimes 5-ranked. *Nut* with interrupted paler transverse lines —Very nearly allied to *S articulatus*, but in the fruiting spikelets the glumes are looser inflated more shining, reminding Nees of hops (whence his name *lupulina*)

11 **S. mucronatus,** *Linn Sp. Pl* 73, stems medium or robust triquetrous nearly leafless, spikelets in a single lateral dense head, glumes ovate subacute, bristles 5 or 6 unequal, style 3 fid, nut obovoid trigonous shining black smooth scarcely transversely wavy *Reichb Ic Fl Germ* viii 40, t 303, *Boeck in Linnæa*, xxxvi 703 S. muticus, *Don Prodr.* 41 S triangulatus, *Roxb Fl Ind* i 217, *Nees in Wight Contrib.* 111. S javanus, *Nees l c* 112 S sundanus, *Miq Fl Ind Bat* iii 304 S. mysurensis, *Herb Heyne*, *Wall. Cat* 3467

Throughout INDIA, alt 0–6000 ft —DISTRIB Europe, Madagascar, warmer Asia, Australia

Roots fibrous or a short horizontal rhizome *Stems* 8–30 in, sheaths triangular-lanceolate membranous at top on one side Lowest *bract* ½–4 in, as though a continuation of the stem trigonous *Spikelets* ⅓–½ in, pale or (especially in the hills) chestnut-colrd. *Glumes* keeled, many ribbed, not notched at top, margins glabrous or minutely scabrous hairy *Bristles* retrorsely scabrous, two longer ones nearly as long as nut *Nut* somewhat compressed, as long as ½ glume

12 **S. corymbosus,** *Heyne ex Roth Nov. Sp Pl* 28, stems stout [illegible]

ii 65, *Nees in Wig*[illegible]
—Isolepis, *Wall C* [illegible]

WESTERN INDIA, Sind, *Pinwill* MOUNT ABOO and GOONAH, *King* JUBBULPORE, *Beddome.* HYDERABAD, *Campbell.* BANGALORE, *Wallich* —Africa, Madagascar

[illegible]

** *Nut smooth or obscurely reticulate (outer cells of nut subquadrate or, if longitudinally oblong, arranged as brick-wall parenchyma)* —*Glumes notched at top, except in* S. grossus *Bristles* 7–2, *rarely* 0

Br Prod 221, *Nees in Wight Contrib* 107, *Miq Fl Ind Bat* iii 309 Schœnus junceus, *Willd Phyt* i 2, t 1, fig 4—Scirpus, *Wall Cat* 3461

Throughout INDIA and CEYLON (except Assam), alt 0–3000 ft —DISTRIB Old

ort usually less than an inch *Head* s though a continuation of the stem, *Spikelets* ⅓–½ in, many fld, sub ae, acutely triquetrous or slightly compressed

Var *uninodis*, heads umbellate on 3–1 rays rarely so much as 1 in S mucronatus, *Roxb Fl Ind* i 216 (*not of Linn*) Isolepis uninodis, *Delile Fl Egypt* 8 t 6, fig 1 I ambigua, *Zoll Syst Verz Ind Archip* ii 62 (*not of Steud*) I oryctorum *Steud Syn Cyp* 96—SIND *Pinwill* BENGAL; *Wallich J D H* COROMANDEL, *Roxburgh*, *Wight* CEYLON, *Leschenault*, *Macrae*—DISTRIB Trop Africa, Java Austral

303 S luzonensis, *Prest Rel Hænk* i 193, *Nees in Wight Contrib* 112 S Wallichii *Nees in Wight Contrib* 112 S junciformis, *Nees l c* 112 (*not of Retz*) S timorensis, *Kunth Enum* ii 162 S supinus, var β and γ *Boeck in Linnæa* xxxvi 600 S lateralis *Herb Heyne* and S ternatus *Herb Ham*, *Wall Cat* 3162 3468, 3469, 4171 Eleocharis juncoides *Schultes in Roem & Sch Syst Mant* ii 90

Throughout INDIA with CEYLON, alt 0–3000 ft —DISTRIB Temp Asia and N Am Austral

This species united with *S supinus* by Boeckeler has been again separated by Bentham l c on the characters of the bristles style branches and nut The two appear amply distinct, *S supinus* has carinate glumes and angular spikelets, *S erectus* has concave glumes and terete spikelets

S. articulatus, stems medium terete spongy e head, glumes ovate acute, rous faintly transverse wavy *et Ic* 53, *Roxb Fl Ind* i losus *Forsk Fl Ægypt Arab* d *Suppl* v 91 S incurvatus 15 Isolepis articulata, *Nees Dalz & Gibs Bomb Fl* 286 Eleocharis in- *all*

Throughout INDIA, alt 0–3000 ft, from the HIMALAYA to CEYLON and MOULMEIN.—DISTRIB Africa, Philippines, Australia

Root fibrous. *Stems* 4–30 in., densely tufted, soft, often (when dry) transversely septate; sheaths at top membranous, soon torn Lowest *bract* similar to the stem appearing a continuation of it, and often longer than it. *Spikelets* ¼–½ in long rusty or purple, usually many, but heads of few spikelets occur *Glumes* slightly keeled, not notched at tip, margins neither fimbriate nor hairy *Stamens* usually 3

Style slender, branches 3 [illegible] nearly half as long as [illegible] trigonous, faces concave

10. **S. quinquefarius,** *Ham. in Wall. Cat.* [illegible] slender terete nearly leafless spikelets 1 [illegible] in a single lat[illegible] glumes broadly ovate acute inflated in fruit bristles [illegible] obovoid triquetrous faintly transversely wavy black. [illegible] xxxvi. 701. Isolepis lupulina *and* I. Royle[illegible] Nees in [illegible] 107.

NORTHERN INDIA from RAWUL PINDEE *Aitchison* SIND [illegible] INDIA, *King* to ASSAM *Wallich* & *Griffith*.—DISTRIB. Turke[illegible] vaal.

Root fibrous. *Ste*[illegible] shining straw brown [illegible] ranked. [illegible] with int[illegible] *articulatus* but in the [illegible] reminding Nees of hops (when [illegible]

11. **S. mucronatus,** *Linn. Sp. Pl.* 73; stems [illegible] triquetrous nearly leafless, spikelets in a single lateral [illegible] [illegible] equal style 3 fid, nut [illegible] [illegible] sversely wavy. *Reich.* [illegible] xxxvi. 703. S. mu[illegible] [illegible] 217, Nees in [illegible] [illegible] idanus *Miq. Fl. Ind. Bat.* [illegible] mysurensis, *Herb. Heyne*; *Wall. Cat.* 3467.

Throughout INDIA alt. 0–6000 ft.—DISTRIB. Europe, Madagascar, warmer Asia, Australia.

[illegible] chestnut [illegible] or minutely scab[illegible] as long as nut. *Nut somewhat compressed, as long as ½ glume.*

12. **S. corymbosus,** *Heyne ex Roth Nov. Sp. Pl.* 28; stems stout [illegible]

WESTERN INDIA. Sind, *Pinwill*. MOUNT ABOO and GOONAH *King*. JUBBULPORE, *Beddome*. HYDERABAD *Campbell*. BANGALORE, *Wallich*.—Africa, Madagascar.

Rhizome 2–4 in., horizontal. *Stems* approximate, 3 ft. at base ½ in. in diam. *Umbel* simple or compound, rays usually short sometimes 5 in. long; lowest bract ½–4 in., suberect, hardly simulating a continuation of stem. *Spikelets* ½–¾ in., rusty. *Glumes* faintly striate glabrous not notched at top. *Nut* scarcely ½ as long as glume, pyramidal at top.—S. *supinus* var. *uninodis* differs by having leaves and nut more obtuse.

** *Nut smooth or obscurely reticulate (outer cells of nut subquadrate or if longitudinally oblong, arranged as brick wall parenchyma).—Glumes notched at top except in* S. grossus. *Bristles* 7–2, *rarely* 0.

13 **S. triqueter**, *Linn Mant* 29, stems stout triquetrous, leaves short, umbel subsimple lateral, spikelets clustered, bristles 3–6 retrorse scabrous, style 2 fid, nut plane convex smooth pale ultimately brown. *Reichb Ic Fl Germ* viii 40, t 305, *Benth Fl Austral* vii 334, in note S Pollichii, *Gren & Godr Fl Franc* iii 374, *Boeck in Linnæa*, xxxvi 711

KASHMIR and BALTISTHAN, alt 6–8000 ft, *Jacquemont, Thomson*, &c —DISTRIB.

anthers with short red crests *Style* fide Boeckeler sometimes 3-fid *Nut* less than ½ length of glume —As to the specific name, Bentham has shown l c that this plant was *S triqueter* Linn, and that Boeckeler erred in discarding that name It hardly differs from *S lacustris* var *carinata*, except by the more acutely triquetrous stem

Var *segregata*, ... bristles 3 (sometimes) 2 ... 335 —Lower Bengal ... —*Stolons* slender ... 3½ in long *Bristles* ...

14 **S. lacustris**, *Linn Sp Pl* 72, stems stout terete or somewhat trigonous, umbels usually compound, spikelets clustered and solitary, bristles 6–5 retrorsely simply scabrous, style 2–3-fid, nut obovoid smooth finally black *Reichb Ic Fl Germ* viii 41, t 306, *Boeck in Linnæa*, xxxvi 712, *Strachey Pl* ... Tabernæmontani *Gmel Fl* ... carinatus *Sowerby Engl Bot* ... t 308 S Meyenii *Nees in* ... t 1983 *Journ Linn Soc* xix 189 ... *Linnæa*, ... Juncus zebrinus, *Gard Chron* [1877] 399, t 62

KASHMIR alt 5500 ft and LADAK ... *Thomson Strachey* ... *Winterbottom* ... Schlagintweit, &c Kumaon, alt. 4500 ft, ... MUNEYPOOR, *Watt* —DISTRIB Europe, Africa Australia, N America

Rh ... horizontal *Stems* 1½–4 ft ... ling in water *Leaves* hardly ... usually once or twice divided, ... 1 head, lowest bract suberect, ... at top with a small mucro in ... as the nut or reduced, some ... glume, plane convex —In ... var *Tabernæmontani* differs ... —(S *lacustris* of S America

722, *Dalz & Gibs Bomb Fl* 288 S corymbosus, *Forsk Fl Ægypt. Arab* 14 (*not of Heyne*) S tridentatus, *Roxb Fl Ind* i 225—Fimbristylis *Wall Cat* 3504, 3505

From KASHMIR, *Jacquemont*, KASHGAR, alt 10 000 ft, *Scully*, and MORADABAD, *T Thomson*, to MALABAR, *Law*, and MYSORE, *Heyne*—DISTRIB Old World, with vars in Australia and America

Rhizome creeping, woody, divided, nodes dilating into tubers *Stems* 1½–6 ft, often covered some way up by sheaths *Leaves* grass like, harsh, often as long as stems *Umbel* very variable in development branches corymbose or subumbellate, spikelets 3–8 or solitary on each ray, or umbel rarely reduced to a head of 3–1 spikelets Lowest *bract* often 4–10 in, sometimes much shorter *Spikelets* large, commonly ½ in in diam *Glumes* erect, fine brown or chestnut colrd (but see var), margins often subfimbriate *Bristles* usually somewhat shorter than the nut, rigid, often unequal *Stamens* 3, anthers red-crested *Style* long *Nut* very variable in size and shape at top, in the Indian form hardly more than ⅓ length of glume

Var *affinis* (sp), Roth Nov Pl Sp 30, spikelets capitate usually 3–1, large

16 **S. littoralis**, *Schrad Fl Germ* i 142, t 5, fig 7, stems stout

716 (*not of Linn*) Malacochæte littoralis, *Nees in Linnæa*, ix. 292 M pectinata, *Nees in Wight Contrib* 110—Fimbristylis, *Wall Cat* 3506 C (*partly*)

From KASHMIR, alt 3500 ft, and BENGAL to CEYLON—DISTRIB Europe, Africa, W Asia, Australia

Glabrous, except margins of glumes

mucronate in notch by excurrent green keel, rusty or brown, ultimately almost scarious *Bristles* (or scales) ligulate (sometimes broad) plumose by spreading moniliform hairs, in the Indian plant often 4, somewhat longer than nut *Stamens* 3 or 2 anthers red crested *Nut* ½ glume, compressed—Easily recognized among the Indian Scirpi by the plumose bristles

17 **S. grossus**, *Linn f Suppl* 104, very large leaves only near base of stem long, corymb large compound depressed divaricate, spikelets very many solitary, glumes ovate not notched, bristles 6 simply scabrous (see also var β) sometimes small or 0, style 3 fid, nut trigonous obovoid smooth ashy grey or black *Roxb Fl Ind* i 231, *Thw Enum* 351, *Dalz & Gibs Bomb Fl* 288, *Boeck in Linnæa*, xxxvi 723 S maximus, *Roxb*

11. **S. triqueter,** *Linn. Mant* 29, stems stout triquetrous, leaves ... umbel subsimple lateral, spikelets clustered, bristles 3-6 retrorse ... style 2 fid, nut plane convex smooth pale ultimately brown. ... *Ic Fl Germ* viii 40, t 305, *Benth Fl Austral* vii 334, in note ... *Gren & Godr Fl Franc* iii 374, *Boeck in Linnæa*, xxxvi ...

... than ½ length ... June —As to the specific name, Bentham has shown l. c that this plant was *S* ... *der*, Linn, and that Boeckeler erred in discarding that name It hardly d... from ... *S lacustris* var *carinata*, except by the more acutely triquetrous stem ...

... trigonous, umbels usu ... *Linn Sp Pl* 72, stems stout terete or somewhat ... bristles 6-5 retrorsely ... ally compound, spikelets clustered and solitary, finally black *Reichb Ic* ... mply scabrous, style 2-3 fid, nut obovoid smooth xxxvi 712, *Strachey Pl* ... *Fl Germ* viii 41, t 306, *Boeck in Linnæa*, Tabernæmontani *Gmel Fl* ... *Fl Germ* ... S validus, *Vahl Enum* ii 268 S carinatus, *Sowerby Engl Bot* ... *Kumaon*, 73 ... *Badens* i 101, *Reichb l c* t 307, 723 S t 308 S Meyenii Nees in ... t 1983 S Duvalii, *Hoppe*, *Reichb l c* 42 *Journ Linn Soc* xix 169 ... *Linnæa*, ix 293 S subulatus *Aitch in* t. 62 ... *Des*moschænus zebrinus, *Gard Chron* [1877] 399

KASHMIR alt 5500 ft and LADAK ... Thomson Strachey ... and Schlagintweit, &c Kumaon, alt. 4500 ft, ... Africa Australia, N America ... MUNEYPOOR, *Watt* —DISTRIB Europe

Rhizome horizontal ... Stems ... *Leaves hardly* ...

... anthers crested ... type *S lacustris*, the stem is terete the style 3 ... long as the glume, plane convex —In ... in style bifid; var *carinata* in stem obscurely trigon ... fid, var *Tabernæmontani* differs ... is *S riparius* ... of S America ...

15. **S. maritimus,** *Linn Sp Pl* 74, stems ... several long, umbel compound simple or capitate ... robust trigonous leaves at top mucronate, bristles 6-3 retrorse scabrous ... glumes notched hairy 3 fid (see var), nut obovoid smooth finally black ... subobsolete style iii *Reichb Ic Fl Germ* viii 42 t 310, 311, ... *Nees in Wight Contrib*

722, *Dalz & Gibs Bomb Fl* 288. S corymbosus, *Forsk. Fl Ægypt. Arab* 14 (*not of Heyne*) S tridentatus, *Roxb Fl Ind* i 225—Fimbristylis, *Wall Cat* 3504, 3505

From KASHMIR, *Jacquemont*, KASHGAR, alt 10,000 ft, *Scully*, and MORADABAD, *T Thomson*, to MALABAR, *Law*, and MYSORE, *Heyne*—DISTRIB Old World, with vars in Australia and America

Rhizome creeping, woody, divided, nodes dilating into tubers *Stems* 1½–6 ft, often covered some way up by sheaths *Leaves* grass-like, harsh, often as long as stems *Umbel* very variable in development, branches corymbose or subumbellate; spikelets 3–8 or solitary on each ray, or umbel rarely reduced to a head of 3 1 spikelets
commonly
margins oft
often uneq
in size and

stem is terminated by one very large spikelet 1½ by ⅛ in

16 **S. littoralis**, *Schrad Fl Germ* i 142, t 5, fig 7; stems stout

bel com
1-3 in
mes ov
mucronate in notch by excurrent green keel, rusty
scarious. *Bristles* (or scales) ligulate (sometimes br
moniliform hairs, in the Indian plant often 4, somewhat
3 or 2, anthers red-crested *Nut* ½ glume, compressed
the Indian Scirpi by the plumose bristles

17. **S. grossus**, *Linn f Suppl.* 104, very
base of stem long, corymb large compound depre
very many solitary, glumes ovate not notched,
(see also var. β) sometimes small or 0, style 3 fi
smooth ashy-grey or black *Roxb Fl Ind* i 231;
& *Gibs Bomb Fl* 288, *Boeck in Linnæa*, xxxvi

2–4 times nut, slender, brown, smooth below, near apex thickened papillose scabrous *Anthers* not crested *Nut* small, ½–⅔ glume, shortly beaked

22 **S. chinensis,** *Munro in Seem Bot Voy Herald*, 423, spikelets clustered bristles 3 slender or 0, style 2 fid, nut compressed ovoid apiculate smooth pale *Benth Fl Hongk* 395 S sylvaticus, *Strachey Cat Pl Kumaon*, 73 S ternatanus, *Reinw*, *Miq Fl Ind Bat* iii 307 S Eriophorum *var* conglomeratus, *Boeck in Herb Berol*—Hypolytrum, *Wall Cat* 3404 D (*partly*)

From CHUMBA and KUMAON, alt 0–5500 ft *Strachey & Winterbottom* to China, Bonin Isles
-7 ft, solitary, in swamps n, ¼ in broad, scabrous on racts several lowest up to many fid, ellipsoid obtuse 0, sometimes 3, rarely 5 overtopping nut as long as glume, ultimately scarcely elongate not twisted (spikelets not comose) smooth, minutely papillose-scabrous near the top *Stamens* 2, rarely 3 anthers scarcely crested *Nut* ½ glume smooth or sometimes microscopically verrucose —The leaf sheaths are long occasionally perforated at base by descending shoots (aerial stolons) covered with small ovate scales

Sect 6 MICHELIANI Low, tufted leafy *Spikelets* small, in a single head, bracts long *Glumes* scarcely acute not notched *Bristles* 0 *Style* long, or branches long continuous with the smooth nut

[illegible] 33, spikelets very brown or black Kyllinga micro

[illegible]

small Kyllinga

24 **S. Michelianus,** *Linn Sp Pl* 76 spikelets numerous densely [illegible] rarely 3-fid) nut oblong or narrowly *Reichb Ic, Fl Germ* viii 43 t Isolepis Micheliana, *Roem & Sch Linn Soc* xxi 29, 30 t. 2 fig 11 Cyperus pygmæus var β, *Boeck in Linnæa*, xxxv 491, *Benth in Gen Pl* iii 1044 (*partly*) C diffusus *Roxb Fl Ind* i 189 (*excl syn*) C mussarius *Herb Ham*, *Wall Cat* n 3395 A Dichostylis Micheliana *Nees in Wight Contrib* 9—Isolepis, *Wall Cat* 3484 A, B

[illegible] passerim, common —DISTRIB

s. *Leaves* often longer than *Spikelets* ⅛–¼ in, rhachilla *Stamens* usually 2, anthers glume, shortly pyramidal at

both ends, outer cells subhexagonal, ultimately lax hyaline (so that a nut appears microscopically hyaline margined) —Ripe examples of this species, with fallen glumes, are easily seen to belong to *Scirpus* not *Cyp rus*, but young small examples are difficult to distinguish from *Cyperus pygmæus*

Sect 7 MICRANTHI Small tufted annuals *Stems* with few short leaves near base *Spikelets* 1–4, capitate, lateral dense fl *Bristles* 0 *Style* very short, branches short, recurved *Anthers* small, oblong

25 **S. Isolepis,** *Boeck in Linnæa*, xxxvi 499, stem setaceous with one spikelet, glumes obovate obtuse, style 2 fid, nut oblong obovoid smooth reticulate, black Hemicarpha Isolepis, *Nees in Edinb N Phil Journ* xvii. 263, and in *Wight Contrib* 92

BENGAL, *Griffith* BEHAR, *J D H* CHOTA NAGPORE, alt 2000 ft, *C B Clarke* DECCAN PENINSULA, *Wight* —DISTRIB Africa

Glabrous. *Stems* ¼–4 in *Leaves* 1–2, ¼–1 in linear *Spikelet* $\frac{1}{10}$–¼ in, rectangularly divaricate, 20–40 fld, bract ¼–1¼ in, erect, as though continuing stem *Glumes* rhomboid, deciduous, rarely minutely mucronate A thin hyaline obovate irregular scale as long as nut (very rarely 2 scales) is sometimes present, oblique lateral between nut and glume *Stamen* 1, lateral *Style* less than ½ nut, deciduous style-base not dilated *Nut* a little shorter than glume, biconvex

26 **S. squarrosus,** *Linn Mant* 181 stem slender with few spike- fid nut narrowly *Rottb Descr et innæa* xxxvi 734 *n Wight Contrib* Ascolepis tenuior, *Steud Syn Cyp* 105 Lipocarpha microcephala, *Hance in Ann Sc Nat* ser 5, v 249 —Isolepis, *Wall Cat* 3477, 3478 B —*Rheede Hort Mal* xii 71, t 38

Throughout EASTERN PENINSULA PUNJAB, alt 0–6000 ft, and ASSAM to CEYLON —DISTRIB Trop Africa Madagasc, Java China

Glabrous *Stems* 2–16 in *Leaves* short, in the Indian specimens commonly 1–2 in, linear *Spikelets* 1–10 (usually 2–4) capitate, divaricate, ⅛–⅕ in, densely softly echinulate from tails of glumes *Glumes* very many, caducous, small, narrowly obovate, suddenly narrowed into the ligulate curved subobtuse tail. *Stamen* 1, sometimes 2, anthers not crested. *Style* scarcely ½ nut, deciduous, style-base scarcely dilated *Nut* a little shorter than glume (without its tail), nearly regularly trigonous

DOUBTFUL SPECIES OF SCIRPUS

brown, few-fld glumes ovate concave mucronulate, style not jointed on the ovary Alps of Nepal, *Wallich*

11 ERIOPHORUM, *Linn*

Glabrous *Stem* with leaves only near base *Corymb* of few (or 1) spikelets, or compound umbelliform *Spikelets* with numerous perfect flowers *Glumes* imbricate on all sides Hypogynous *bristles* 6, divided nearly to base, segments ligulate, finally elongate i e heads comose

Stamens 3–1, on the anterior side of nut *Style* slender, glabrous deciduous, long (in Sect *Lachnophorum* short), branches 3 (accidentally 2 or 4) long *Nut* sessile, trigonous, smooth, dusky black, apex narrowed — Species 10, Arctic or N Temperate, except Sect *Lachnophorum*

The genus was well marked, until Bentham (Gen Pl iii 1052) removed the comose species of *Scirpus* (the *Sylvaticæ* Sect) into it on the ground that the

Sect. I ERIOPHORUM proper *Leaves* moderately long *Style* long

1 E. ... not
lacerat ... *ichb*
Ic Fl ... tum,
Host G ... E
humile ... *var*
humile

KASHMIR, alt 13,000 ft *Lance*, *C B Clarke* — DISTRIB Arctic and Alpine regions

Stems 4–12 in, often covered some way up by sheaths *Leaves* (except in dwarf examples) shorter than stem edges (in dried specimens) much inrolled *Spikelet* ½ in, broad ellipsoid *Glumes* ovate, scarious and black *Bristles* white, or ultimately brownish *Anthers* not crested *Style* longer than nut, very slender, branches 3 long *Nut* ½ glume trigonous cylindric ellipsoid or subovoid

Sect II LACHNOPHORUM, *F Nylander in Acta Soc Sc Fenn* iii 22 *Leaves* numerous linear long *Glumes* keeled, acute *Style* short (branches long)

2 **E. comosum,** *Wall Cat* 3446 (*excl* var β), stems robust umbel compound or decompound spikelets numerous rusty brown, style 3 fid *Nees in Wight Contrib* 110 (*excl var* β), *Miq Fl Ind Bat* iii 330, *Boeck in Linnæa*, xxxvii 98 E arundinaceum, *Wall Cat* 3448, *Nees l c* Scirpus comosus, *Wall in Roxb Fl Ind* ed Carey and Wall. i 231 S elongatus, *Ham ex Don Prodr* 40 Trichophorum comosum and T arundinaceum, *Strachey Cat Pl Kumaon* 73 — Eriophorum, *Wall Cat* 3447, *partim*

Very common; from SIND and the HIMALAYA, alt 0–10,000 ft. to SAUGOR, CHITTAGONG, and BURMA — DISTRIB Tonkin, China

Glabrous ... *Stems* 4–20 ... *Leaves* often
overtopping ...
often lacerat ...
very long, of ...
acute or obt ...
Style shorter ...
brown-black ...
angustifolius ...
Spodiopog n angustifolius

3 **E. microstachyum,** *Boeck in Linnæa* xxxviii 390, stem 2–6 in slender with 1–3 subcapitate chestnut brown spikelets, style 3 fid E comosum, β nanum, *Nees in Wight Contrib* 110

ALPINE HIMALAYA alt 8 16 000 ft Head of Jumna Valley *Jacquemont*, Mynee Tal *Thomson*, Chupcha in Bhotan *Griffith*

This may be regarded as a depauperated alpine form of *E comosum* but the examples are numerous exactly alike from distant localities and there are wanting intermediate forms

12 FUIRENA, *Rottb*

of petals) or much reduced or 0 3 sepals bristle like 3 petals (in the ... *Style* long ... all obovoid ... or trabecu ... may be the

The spikelets with the stem leafy in upper half are like no other sedges but the *Sylvaticæ* section of *Scirpus* from which *Fuirena* is known by its strongly aristate glumes

Sect I PSEUDO SCIRPUS Three inner hypogynous bristles (petals) linear or narrow, or more often 0

1 **F. pubescens,** *Kunth Enum* ii 182 spikelets in a terminal cluster (axillary clusters not rarely added) hypogynous bristles 0 or rudimentary linear style 3 fid nut smooth white not (or most minutely obscurely) reticulated *Boeck in Linnæa* xxxvii 104 (excl all Indian syns and specimens) Scirpus pubescens *Lam Ill* i 139 *Desfont Fl Atlant* i 52 t 10 Carex pubescens *Poir Voy en Barb* ii 254 C Poiretii *Linn Syst* [ed Gmelin] ii 140 Isolepis pubescens *Roem & Sch Syst* ii 118

PUNJAB *T*

2 **F. Wallichiana,** *Kunth Enum* ii 182 spikelet clusters corymbed, hypogynous bristles 0 or linear (see also var) nut slenderly striate longi ... F cuspidata *Kunth l c* 187 ... s *Boeck in Linnæa* xxxvii 104 ... *Kunth*) Scirpus cuspidatus, ... *t* 3045

N W INDIA Hurdwar *Wallich*, Sutledge Valley, *Thomson* CENTRAL INDIA Goona &c *King* KHANDWA, *Duthie* POONA *Jacquemont* BOMBAY, *Dalzell* &c

Hardly distinguishable from *F pubescens* Kunth but by the elegantly striate nut and more compoundedly corymbose inflorescence *Leaves* and sheaths glabrous *Sepals* often ½ ¾ nut, linear often unequal, retrorsely scabrous or smooth often 0 *Petals* always 0 (except in var) *Nut* ellipsoid trquetrous narrowed at both ends, yellow brown or testaceous beak small pyramidal hardly scabrous, outermost cells transversely oblong superimposed regularly in longitudinal series

Stamens 3–1, on the anterior side of nut *Style* slender, glabrous, deciduous, long (in Sect *Lachnophorum* short), branches 3 (accidentally 2 or 4) long. *Nut* sessile, trigonous, smooth, dusky black, apex narrowed — Species 10, Arctic or N Temperate, except Sect *Lachnophorum*

The genus was well-marked, until Bentham (Gen Pl iii 1052) removed the comose species of *Scirpus* (the *Sylvaticæ* Sect) into it on the ground that the hypogynous bristles are similar But in each flower of *Eriophorum* the bristles are

Sect I Eriophorum proper *Leaves* moderately long *Style* long

1 E. [illegible]

lacera

Ic Fl

Host (

humil

humil

Kashmir, alt 13,000 ft *Lance*, *C B Clarke* — Distrib Arctic and Alpine regions

Stems 4–12 in, often covered some way up by sheaths *Leaves* (except in dwarf examples) shorter than stem, edges (in dried specimens) much inrolled *Spikelet* ½ in broad ellipsoid *Glumes* ovate, scarious and black *Bristles* white, or ultimately brownish *Anthers* not crested *Style* longer than nut, very slender, branches 3, long *Nut* ½ glume, trigonous cylindric ellipsoid or subovoid

Sect II Lachnophorum, *F Nylander in Acta Soc Sc Fenn* iii 22 *Leaves* numerous linear long *Glumes* keeled, acute *Style* short (branches long)

2 **E. comosum,** *Wall Cat* 3446 (*excl* var β), stems robust, umbel compound or decompound spikelets numerous rusty brown style 3 fid *Nees in Wight Contrib* 110 (*excl var* β), *Miq Fl Ind Bat* iii 330, *Boeck in Linnæa*, xxx 3448, *Nees* *l c* Scirpus comosus, Wall. i. 234 elongatus, *Ham ex* ium and T arundinaceum, *Strache* , *Wall Cat* 3447, *partim*

Very common; from Sind and the Himalaya, alt 0–10,000 ft. to Saugor, Chittagong, and Burma — Distrib Tonkin, China.

Glabrous *Rhizome* hardly any *Stems* 4–20 in, slender, tough. *Leaves* often

Spodiopogon angustifolius

3 **E. microstachyum,** *Boeck in Linnæa*, xxxviii 390, stem 2–6 in slender with 1–3 subcapitate chestnut brown spikelets, style 3-fid E. comosum β nanum, *Nees in Wight Contrib* 110

ALPINE HIMALAYA alt 8-10,000 ft   head of Jumna Valley, *Jacquemont*, Synee Tal *Thomson*, Chupcha in Bhotan *Griffith*

This may be regarded as a depauperated alpine form of *E comosum*, but the examples are numerous exactly alike from distant localities, and there are wanting intermediate forms

12 FUIRENA, *Rottb*

Stem bearing leaves or leaf like bracts even in its upper half *Leaves* grass-like base sheathing *Spikelets* clustered with numerous perfect flowers tabescent at top *Glumes* imbricate on all sides, strongly aristate, hairy in upper half Hypogynous *bristles* 6 (3 in the position of sepals, 3 of petals) or much reduced, or 0, 3 sepals bristle like, 3 petals (in the typical species) battledore-shaped *Stamens* 3 anticous, or 2 *Style* long, slender, glabrous, finally deciduous, branches 3, long *Nut* small, obovoid, or ovoid triquetrous, more or less stalked, smooth reticulated or trabeculate usually narrowed at top often with a minute beak (which may be the persistent style base) —Species 25, scattered all warm regions

The spikelets with the stem leafy in upper half are like no other sedges but the *Sylvaticæ* section of *Scirpus*, from which *Fuirena* is known by its strongly aristate glumes

Sect I PSEUDO-SCIRPUS Three inner hypogynous bristles (petals) linear or narrow, or more often 0

1 **F. pubescens,** *Kunth Enum.* ii 182, spikelets in a terminal cluster (axillary clusters not rarely added), hypogynous bristles 0 or rudimentary linear, style 3 fid, nut smooth white not (or most minutely obscurely) reticulated *Boeck in Linnæa*, xxxvii 104 (excl all Indian syns and specimens) Scirpus pubescens, *Lam Ill* i 139, *Desfont Fl Atlant* i 52, t 10 Carex pubescens, *Poir Voy en Barb* ii 254 C Poiretii, *Linn Syst* [ed Gmelin] ii 140 Isolepis pubescens, *Roem & Sch Syst* ii 118

[illegible] S W [illegible] all Africa

[illegible]

2 **F. Walli[illegible]** [illegible] 180 [illegible] clusters [illegible]

[illegible]

[illegible] Fuirena, [illegible]

N W INDIA. Hurdwar, *Wallich*; Sutledge Valley, *Thomson* CENTRAL INDIA; Goona, &c, *King*. KHANDWA, *Duthie*. POONA, *Jacquemont* BOMBAY, *Dalzell*, &c

Hardly disti[illegible] nut, and more c[illegible] *Sepals* often ½ [illegible] *Petals* always 0 [illegible] yellow brown o[illegible] cells transversel[illegible]

sessile, turgid, chestnut brown, with 12 18 transverse wrinkles, beak (in the Old World examples) broadly conic, smooth or nearly so [The names *glauca* and *gracilis* were published in the same volume Many authors prefer the *gracilis* supposing the species to be Swartz's *Schœnus gracilis* But Swartz says his *Schœnus gracilis* had a 3 fid style, so that it was no *Rynchospora* (except perhaps in small part by mixture), Mr Bentham has hence adopted *glauca*]

10 **R. Griffithii,** *Boeck in Linnæa,* xxxviii. 404, nut narrowly obovoid ellipsoid rounded at top beak ¾ nut, hypogynous bristles reaching top of beak scabrous, otherwise as *R glauca*

EAST BENGAL, *Griffith (Kew Distr* 6303) ASSAM, *Griffith* KHASIA, *J D Hooker*, alt 4200 ft, *C B Clarke*

Var β LEVISETIS, hypogynous bristles 6 twice nut smooth *R chinensis, forma tenuis*" *Boeck l c* 587 —Upper Sikkim, Lachen and Lachoong, alt 10 000 ft, in wet meadows *J D H*—A remarkable form, an alpine state of *R Griffithii* The nut is narrow so that Boeckeler's alliance of it with the sea-coast *R chinensis* is not satisfactory

11 **R. sikkimensis,** *C B Clarke*, glabrous panicle narrow, corymbs rather small spikelets numerous bearing 3–6 nuts, hypogynous bristles 6 scabrous twice nut, style branches 2 long, nut small narrowly obovoid truncate beak ovoid longer and broader than nut smooth (otherwise as *R Griffithii*)

UPPER SIKKIM, Catsuperri Lake alt 8000 ft —*J D H*

Spikelets ⅙ in fine brown with 12 18 glumes and 3–8 pistilliferous flowers — This plant may be the *R chinensis* described by Boeck in Linnæa, xxxvii 587, which he says has about 5 fertile flowers to the spikelet, but it does not agree in this particular with *Thwaites n* 677 which is Boeckeler's type of *R Chinensis*

UNDETERMINABLE SPECIES OF RYNCHOSPORA

Scirpus (Rynchospora?) MOLLIS *Wall in Roxb Fl Ind* [*ed Carey and Wall*] i 227, stems 1 2 ft. hairy leaves few towards base of stem hairy, umbel 7-rayed,

The style being compressed must be assumed to be 2 fid; this, joined to the 3 long hypogynous bristles would fix the plant in Rynchospora (as suggested by Wallich), but it cannot be referred to any known Indian species of that genus

15 SCHŒNUS, *Linn (in part)*

Spikelets capitate or panicled, flowers axillary *Glumes* (except the

THE

FLORA OF BRITISH INDIA.

BY

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ASSISTED BY VARIOUS BOTANISTS.

VOL. VI.

ORCHIDEÆ TO CYPERACEÆ.

LISHED UNDER THE AUTHORITY OF THE SECRETARY OF STATE FOR INDIA IN COUNCIL.



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1894.

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hollow of the zigzag persistent rhachilla, trigonous —Species 59 chiefly Australian, with a few Cosmopolitan, Malayan, Japanese and Chilian

1 **S. nigricans,** *Linn Sp Pl* 64, stem without nodes except near
obso-
)rient
Kunth

PUNJAB, Kurum Valley, *Aitchison* , SIND, *Pinwill* —DISTRIB Nearly cosmopolitan, except S E Asia and Australia.

Almost glabrous *Rhizome* horizontal, woody, stolons 0 *Stems* 4 24 in, subterete *Leaves* 4–12 in, often half stem very narrow with incurved margins *Spikelets* 1–15 $\frac{1}{4}$–$\frac{1}{3}$ in long, in a close distinctly compound head, lowest bract sub-erect, often 1–4 in *Glumes* ovate obtuse, microscopically hispid on keel chestnut or brown, three lowest empty, 1–3 next nut bearing *Nut* $\frac{1}{20}$ in ellipsoid, top acutely pyramidal

2 **S. calostachyus,** *Poir Encycl Suppl* ii 251, stem with nodes throughout its length, spikelets nearly 1 in long loosely panicled, hypogynous bristles $\frac{1}{4}$ nut white style 3 fid nut ovoid slightly tubercular or wrinkled chestnut black *Benth Fl Austral* vii 368 Chætospora calostachya, *Br Prodr* 233 Cyclocampe waigiouensis, *Steud Syn Cyp* 156 Cyclocarpa waigouensis, *Miq Fl Ind Bat* iii 339

SINGAPORE, *Ridley* —DISTRIB Malaya, Australia

Rhizome short, horizontal woody *Stems* 1–2$\frac{1}{2}$ ft, rigid, rather slender subterete Lower *leaves* 4 12 by $\frac{1}{12}$ in glabrous sheaths at their mouth scarious, scarcely pubescent *Panicle* 8 16 in long, with 8–14 spikelets, lower bracts like the leaves upper reduced nearly to sheaths *Spikelets* elliptic-lanceolate, compressed, chestnut or brown *Glumes* ellipt c lanceolate, scarcely acute, minutely hairy on margins, 4 8 lowest empty, densely packed, 3 2 following nut bearing, distant on zigzag rhachilla *Nut* $\frac{1}{8}$ in, subsessile, trigonous, curved

16 CLADIUM, *P Browne*

Stout perennials, glabrous or inflorescence minutely hairy *Stems* round or flattened, leafy or leafless *Leaves* equitant xiphoid or trigonous at top, or flat *Spikelets* panicled, often in sessile clusters at the angles of zigzag branches, small, with 4–11 glumes *Flowers* 1–7, axillary, lowest
r i
t
all,
branches 3, long, style base dilated, fu
middle sized, beak large pyramidal, or smaller umbonate, or undistinguishable from nut, or reduced to a speck —Species 44, one cosmopolitan, the rest insular or maritime, in both hemispheres

Subgenus I EUCLADIUM *Benth Fl Austral* vii 402 *Stems* tall, round with nodes carrying leaves (or leaf-like bracts) their whole length *Leaves* flat, not distichous *Panicle* oblong of several corymbs. *Spikelets* numerous, clustered, most 2 fld, the lower flower nut bearing

1 **C. Mariscus,** *Br Prodr* 236, stems 3–8 ft, leaves $\frac{1}{2}$ in broad scabrous, glumes brown subobtuse, hypogynous bristles 0, style 3 fid. nut ovoid acute shining chestnut cold *Boeck* in *Linnæa* xxxviii 232. C.

hollow of the zigzag persistent rhachilla, trigonous —Species 59 chiefly Australian, with a few Cosmopolitan Malayan, Japanese and Chilian

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PUNJAB Kurum Valley, *Aitchison* SIND, *Pinwill* —DISTRIB Nearly cosmopolitan except S E Asia and Australia.

Almost glabrous *Rhizome* horizontal, woody, stolons 0 *Stems* 4 24 in, subterete *Leaves* 4–12 in, often half stem very narrow with incurved margins *Spikelets* 1 15 ⅓–½ in long in a close distinctly compound head, lowest bract suberect often 1–4 in *Glumes* ovate obtuse microscopically hispid on keel, chestnut or brown, three lowest empty 1–3 next nut bearing *Nut* $\frac{1}{30}$ in ellipsoid, top acutely pyramidal

2 **S. calostachyus,** *Poir Encycl Suppl* ii 251, stem with nodes throughout its length, spikelets nearly 1 in long loosely panicled, hypogynous bristles ⅓ nut white style 3 fid nut ovoid slightly tubercular or wrinkled chestnut black *Benth Fl Austral* vii 363 Chætospora calostachya, *Br Prodr* 233 Cyclocampe waigiouensis, *Steud Syn Cyp* 156 Cyclocarpa waigouensis, *Miq Fl Ind Bat* iii 339

SINGAPORE, *Ridley* —DISTRIB Malaya, Australia

Rhizome short horizontal woody *Stems* 1–2½ ft, rigid rather slender subterete Lower *leaves* 4–12 by $\frac{1}{10}$ in glabrous sheaths at their mouth scarious, scarcely pubescent *Panicle* 8 16 in long, with 8–14 spikelets lower bracts like the leaves upper reduced nearly to sheaths *Spikelets* elliptic-lanceolate, compressed, chestnut or brown *Glumes* elliptic lanceolate, scarcely acute, minutely hairy on margins, 4-8 lowest empty, densely packed, 3-2 following nut bearing, distant on zigzag rhachilla *Nut* ⅛ in, subsessile, trigonous, curved

16 CLADIUM, *P Browne*

Hypogynous *bristles* slender, or small, or 0 *Stamens* 3–2 *Style* linear

rest insular or maritime, in both hemispheres

1 **C. Mariscus,** *Br Prodr* 236, stems 3–8 ft, leaves ½ in scabrous, glumes brown subobtuse, hypogynous bristles 0, style 3-fid, ovoid acute shining chestnut colrd *Pocck in Linnæa* xxxviii 232

WEST AUSTRALIA

Stolons long, densely clothed by lanceolate striate dirty straw colrd scales *Stems* 3 ft, trigonous under panicle flattened biconvex Basal *leaves* often as long as stem, hardly ¼ in broad, in their upper half very variable in form, sometimes
: nerve) sometimes 3–4 angular or
, lower branches distant lowest
, minutely scabrous puberulous
rown lowest flower perfect, nut-bearing *Fl glume* ovate lanceolate at least as long as the two lower empty glumes *Nut* in sessile, brown, beak ⅓ nut

Var 2 ¼
flowers a assa,
Thw En ASIA,
alt 5000 ova
Thwaites C P 845 —In the Ceylon examples (*crassa* type) with which the Bengal agree, the roots are thick black (the plant probably not stoloniferous), the nuts are *nearly twice as long as in the Australian plant shining brown But in the Khasi* plant, stolons are generally present and the nuts are like those of *C riparium*, Benth typ

leaves linear in
u panicle elongate
n oblong ellipsoid
ol ii 304 *Benth Fl Austral* vii 404 (not *Baumea glomerata*, Gaud) Chapelliera glomerata, *Nees in Lehm Pl Preiss* ii 76 *in Obs* *Miq in Ann Mus Lugd Bat* ii 146 Baumea rubiginosa & Brownei, *Boeck in Linnæa*, xxxviii 241, 242

throughout
10 by
usters
Fl
glumes ovate acute, keel upwards

17 MICROSCHŒNUS, *Gen Nov*

A very small, glabrous perennial *Stems* with nodes, bearing narrow leaves *Inflorescence* of 1–3 approximated spikelets *Glumes* 6, imbricate on all sides, subsimilar, two lowest empty, 3 (or 2) following male, monandrous, uppermost lateral (appearing terminal) perfect, nut-bearing, monandrous Hypogynous *bristles* 2, minute, rudimentary (perhaps reduced stamens) *Style* linear cylindric, smooth, continuous with pistil, branches 3 *Nut* (not well ripe) ellipsoid, trigonous, smooth, pyramidal at base and top

M. Duthiei, *C B Clarke*, stems 1–3 in

WEST HIMALAYA, Gurwhal, T hri alt 15,000 ft, *Duthie*

Stems tufted, with very short stolons or short lateral shoots. *Leaves* 2 or 3 on each stem, about 1 in, grass like, margins incurved, smooth, sheaths short *Spikelets* about ¼ in ellipsoid; lowest bract similar to leaves, upper bracts gradually shorter, passing into glumes *Glumes* ovate-oblong concave scarcely keeled chestnut red, hardly scarious on edges *Anthers* linear-oblong, not crested, scarcely exserted.

germanicum, *Schrad*
Inst i 362 Schœnus

aicense, *Crant.*

KASHMIR, Lake alt 5...
Glabrous stoloniferous ... osmopol tan
and midrib beneath cutting ... m, teeth on margins
...mes corymbosely divided, ... , corymbs distant, several
clusters of 4–12 ... in, yo... *spikelets* usually in globose
3 7, ovate, concave, 3–4 low ... ovoid uniform brown *Glumes*
Stamens usually 2, anthers ... rhachilla abbreviated, persistent
base ovoid, large, fused into nu... ...ested *Nut* scarcely $\frac{1}{12}$ in, hard, style-
... the cavity is carried up into style-base

Subgenus II MACHÆRINA (Genus), *Vahl Enum* ii 238 Clusters
panicled, mostly sessile at the angles of zigzag branches Hypogynous
bristles small *Nut* more or less stalked, rostrate

2 **C. Maingayi,** *C B Clarke* stems stout flattened basal leaves
quitant $\frac{3}{4}$ in broad spikelets dark red hypogynous bristles slender longer
than nut, style 3 fid, nut turgid trigonous shortly stalked, beak long
pyramidal hairy

MT OPHIR (Malacca) alt 4250 ft, *Griffith (Kew D strib* 6304) &c
Stems 1–3 ft Basal *leaves* several crowded often as long as stem stem leaves
or occasionally 1 *Panicle* 12 18 in oblong lowest branch often distant
spikelets $\frac{1}{4}$ in, ovoid, usually bearing 2–4 nuts *Glumes* ovate t p triangular
scarcely acute, 2–3 lowest empty Hypogynous bristles 6 their upper half thinly
toothed with short upward pointing hairs. *Nut* $\frac{1}{10}$ in long on a short obpyramidal
stalk —Very near the West Indian *Machærina restioides* Vahl

3 **C. undulatum,** *Thw Enum* 353 stem long *round trigonous*,
leaves basal very narrow, spikelets brown hypogynous bristles much
shorter than nut, style 3 fid nut sessile ovoid brown beak very small
Lepidosperma zeylanicum *Nees in Linnæa* xxxviii 292 Tricostularia
fimbristyloides *Benth Fl Austral* vii 384 Carpha junciformis, *Boeck*
Linnæa, v 38, 267

CEYLON, *Rottler, Thwaites*, &c MALAY PENINSULA, Pahang, *Ridley* —Dis
... Malaya, Australia.
Nearly ...mooth and glabrous *Stem* 1–3 ft, somewhat slender leafless except
... base ... *Leaves* 9–18 by $\frac{1}{8}$ in, convolute when dry *Panicle* 2–12 in, greatly
... development, branches flexuose or zigzag, lowest bract leaf-like or short,
... bearing ... clusters of 2–5, $\frac{1}{4}$ in long, ellipsoid, 1–2 fl, lower flower perfect,
... *Glumes* not distichous, two lowest smaller, empty Hypogynous
... ...dly $\frac{1}{4}$ nut setaceous, base dilated white *Nut* scarcely $\frac{1}{12}$ in, smooth,
... pyramidal or umbonate, not $\frac{1}{4}$ nut, hairy —The hypogynous bristles
... *Lepidosperma*, but the lower flower producing the nut does not suit that
... ...am (*Fl Austral* vii 384) considers the Ceylon, Borneo, and Aus-
... were united as three species

...cies)

4 **C. riparium,** *Benth Fl Austral* vii. 405, stems obscurely flattened
line leaves few obscurely xiphoid or subterete panicle elongate lax of
many spikelets, style 3-fid, nut obovoid round trigonous smooth, beak
ll conic minutely hairy Baumea riparia, *Boeck in Linnæa*, xxxviii.

CANARA *Dalzell* MALABAR or CONCAN *Stocks* WYNAAD Goodaloor *King* NICOBARS *Kurz*

Distributed in Herb H f and T as a local form of *H latifolium* which it closely resembles The nut is usually glandular punctate pitted rugose or nearly smooth

3 **H. turgidum,** *C B Clarke* stem stout leaves long $\frac{3}{4}$ in broad panicle compound dense spikelets often of three glumes (besides the bracteole) style 2 fid fertile nut large brown purple punctate beak small or hardly any H latifolium *Thw* *Enum* 346 (*partly*)

CEYLON Central Province alt 3000 ft *Thwaites* (C P 3)

Thwaites subsequently (in mss) separated this as a distinct species The two boat shaped squamellæ are lateral (as in all the *Mapanieæ*) the third extra glume is flat concave without keel on the anterior side of the spikelet than the squamellæ A similar extra glume occurs frequently in several of the large American *Hypolytreæ* thus indicating an approach to *Thoracostachyum*

4 **H penangense,** *C B Clarke* stem stout leaves long $\frac{1}{2}$-$\frac{3}{4}$ in broad panicle compound of 100 spikes young spikes $\frac{1}{8}$ by $\frac{1}{16}$ in linear cylindric

PENANG *Maingay* (Kew D tr b 1720)

Imperfectly known from a young example but the young spikes differ much from those of *H latifolium* at the same point of development

5 **H trinervium** *Kunth Enum* ii 272 stem somewhat slender leaves $\frac{1}{4}$ $\frac{1}{3}$ in broad bracteoles broad oblong obtuse entire brown not scarious margined style 2 fid nut small black purple beak conical pale nearly as long as nut *Miq Fl Ind Bat* iii 332 and *Ill Fl Arch p Ind* 59

EAST INDIES (*Herb Willdenow*)

Altogether slenderer than *H latifolium* to which Boeckeler refers it as a weak example — *St m* 16 in cauline leaves 1 or 2 remote *Panicle* 1 1½ in diam with 20 spikes *Spikes* in ut scarcely ¼ in lam themselves their glumes (bracteole) and nuts much smaller than in *H latifolium* *Nut* (with its beak) less than $\frac{1}{10}$ in beak straw colrd densely covered with round red glands

6 **H proliferum,** *Boeck in Linnaea* xxxvii 126 stem somewhat slender leaves $\frac{1}{4}$–$\frac{1}{3}$ in broad bracteoles oblong obovate brown upper margin conspicuously white scarious lacerate style 2 fid nut small dusky brown beak conical dusky brown rather shorter than nut

SINGAPORE *Wallich* cl ura *R dl y* — DISTRIB Borneo

Rhizome woody obliquely descending (not proliferous branched as described by Boeckeler) *Stem* 16 in cauline leaves 1 or 2 remote *Panicle* 1 1½ in diam with 20 sp

scarious ma

da subul

trinerv u

7 **H longirostre,** *Thw Enum* 346 stem 12 20 in corymb rigid bracteoles hard subacute one (or more) squamella often interposed between the two basal male squamellæ and pistil style 2 fid, beak longer than nut conic acute pale not grooved *Kurz in Jour As Soc Beng* xxxv pt ii 75 *Boeck in Linnaea* xxxvii 138 H latifolium *y* minor *Kurz* (*partly not of L C Rich*)

CEYLON *Thwaites* (C P 3468)

Stolons long slender clothed by small red brown scales, harde in a

and *H longirostre* *Style* continuous with ovary, persistent, branches 2 long *Nut* small, but often overtopping bracteoles biconvex, osseous subpersistent, style base ultimately becoming a conical or ovoid beak — *Species 25* tropical and subtropical

This and the follow
p 587) or *Mapanieæ*
may prove useful —S
Scirpus the (apparen
terminal fe
drous male
are placed
1–6 mona
to the p sti
hairy on keel placed laterally with respect to the bracteole *Stamen* small; anthers not crested

1 **H. latifolium,** *L C Rich in Pers Syn* i 70 stems stout triquetrous upwards leaves long often ½ 1 in broad style 2 fid, nut (fertile) wrinkled brown or chestnut beak small conical pale (large when nut is barren) *Thw Enum* 310 (*B and part a*) *Kurz in Journ As Soc* xxxviii, *part* 2 72 (*partly*) H giganteum *Wall Cat* 3404 (*partly*), *Nees in Wight Contrib* 93 (*partly*) *Boeck in Linnæa* xxxvii 141 H schœnoides *Nees in Linnæa* ix 288 H myrianthum *Miq Fl Ind Bat* ii 333 H latifolium and diandrum *Dietr Sp Pl* ii ... Lunga diandra *Roxb Fl Ind* i 184 Scirpus anomalus *Retz Obs* v 1... Albikia scirpoides and schœnoides *Presl Rel Haenk* i 185, t. 34, 5 — Hypolytrum *Wall Cat* 3402 3403 3404 (*mainly*)

SIKKIM and ASSAM to SINGAPORE, TRAVANCORE CEYLON, NICOBAR and ANDAMAN ISLDS.—DISTRIB Malaya, China, Austral Polynesia.

Rhizome perennial short roots thick, smooth, very tough *Stem* 1 3 ft, smooth or slightly scabrous, bearing nodes and leaves above the base often above the middle *I*
pyramidal
depauperate
nearly all ...
(i.e. bracteoles) closely spirally imbricate, scarcely ... in long, concave, elliptic, obtuse membranous, 1 nerved brownish *Squamellæ* ... plane *Nut* (with the beak)

... are ... not, it is not possible to arrange the Khasian plant under both

2. **H. Wightianum,** *Boeck in Linnæa*, xxxvii p 1... stems stout, leaves ... style 2 fid, nut (fertile) straw ... beak ... H giganteum, *Nees in Wight Contrib* ... (*partly*) —*Rheede Hort Malab* xii t ...

Sect I HALOSTEMMA (Genus) *Wall ex Benth in Gen Pl* iii 1070 (*by a misreading of bad lithography*) *Leaves* long narrowed at both ends *Lateral scape* long or short *Spikes* capitate in a single head, distinct, of many spikelets bracts shorter than spikes *Spikelets* often ¼ in *Nut* dry buried in the chaffy bracteoles and glumes, beak small conic, or hardly any

1 **M. silhetensis,** *C B Clarke*, scape 1–2 ft smooth upwards with 1–6 spikes leaves often 1 in broad scarcely scabrous on the keel beneath, bracteoles ¼ in 3–5 striate, style 3 fid, nut ovoid much narrowed at base almost stalked Pandanophyllum palustre β silhetana *Kurz in Journ As Soc Beng* xxxviii pt ii 79 (*partly*)—Cyperacea, *Wall Cat* n 4474

UPPER ASSAM, alt 300 ft *Jenkins, C B Clarke* SYLHET, *Wallich*

ins scabrous *Scape* ro- *Spikes* ⅔ in ellipsoid, persistent *Squamellæ* rd lateral glume sterile ., beak very small, fused with nut

2 **M. palustris,** *Benth in Gen Pl* iii 1070, scape 1–2 ft glandular-scabrous upwards with 10–50 spikes leaves often 1⅓ in broad acutely scabrous on keel beneath bracteoles ¼ in lacerate at top often sub bifid, style 3 fid, nut ovoid little narrowed at base Pandanophyllum palustre, *Boeck in Linnæa*, xxxvii 138, *Kurz in Journ As Soc Beng* xxxviii part 2 78 (var malesica) (*not of Hassk*) Lepironia palustris, *Miq Ill Fl Archip Ind* 63, t 25

3 **M. Kurzii,** *C B Clarke*, scape 4–16 in smooth upwards with 1–15 spikes, leaves 1 in broad aculeate on keel beneath, bracteoles ⅔ in strongly 13 striate reddish brown

MALACCA, *Griffith* (*Kew Distrib* 6356) PERAK, alt 1750 ft., *King* PENANG, on Government Hill, alt. 1750 ft., *Maingay, King*

Rhizome thick *Leaves* densely equitant, very rigid harsh, as of a Pandanus, tips long attenuate, trigonous, aculeate *Inflorescence* 1 in diam, rigid, bracts short, ovate, brown *Spikes* ¼ in, ellipsoid, brown *Bracteoles* ovate, obtuse rigid, incurved entire at apex *Squamellæ* nearly as long as bracteole, brown *Nut* not seen —Closely allied to *M palustris*, spikes and spikelets rather smaller

4 **M. andamanica,** *C B Clarke*, scape 4–12 in smooth upwards, leaves broad almost flaccid smooth on keel beneath, bracteoles ⅜ in

Nut scarcely 1/10 in., subglobose, olivaceous, wrinkled

22. THORACOSTACHYUM, Kurz

1. **T. bancanum,** *Kurz* in *Tydsch Nat Vereen Nel Ind* xxvii 226, and in *Bot Zeit* xxiii (1865) 204 (*Thoracostachys, name only*) and in *Journ As Soc Beng* xxxviii. pt ii 76, stem 1½–3 ft, corymb rigid, spikes short ellipsoid, style 3 fid, nut shining testaceous with 3 longitudinal grooves in its conical top Lepironia bancana, *Miq Fl Ind Bat Suppl.* 604 and *Ill Fl* ... *Kurz in Journ As Soc Beng* ... 59 Mapania bancana *Benth* ... m, *Wall Cat* 3401, 3404 B —

SINGAPORE *Wallich, Ridley* MALACCA; *Griffith (Kew Distrib* 6273) —

about 1/10 in, beak none, or rather completely fused with nut, grooves very narrowly spathulate

Var *longispica*; spikes ½ in oblong smutted, nuts perfect—Malacca, *Griffith, Kew Distrib* n 6357) —The abnormal elongation of the spikes is supposed due to the *Ustilago*

2. **T. hypolytroides,** *C B Clarke*, very large, panicle large decompound with 800 spikes, glumes (bracteoles) membranous elliptic, 4 glumes intercalated between two basal male fl and pistil, style 3 fid Hypolytrum Pandanophyllum and Pandanophyllum hypolytroides, *F Muell Fragm* ix 16 Mapania hypolytroides, *Benth Fl Austral* vii 341 M. Pandanophyllum, *Schum & Hollr Kaiser Wilhelms Land*, 25

MALAY PENINSULA, Johore, *Ridley* n 4093 —DISTRIB N Guinea, Queensland *Stem* 3–5 ft. *Bracts* 32 by 1 in, 3 nerved *Panicle* 12 by 8 in *Spikes* solitary ½ in, cuboid ellipsoid, of very many spikelets

23 MAPANIA, Aubl

upper as though . . .
with ovary persi
or succulent, bea

Sect I HALOSTEMMA (Genus) *Wall ex Benth in Gen Pl* iii 1070 (*a misreading of bad lithography*) *Leaves long narrowed* at both ends *Lateral scape* long or short *Spikes* capitate in a single head, distinct, of many spikelets bracts shorter than spikes *Spikelets* often ¼ in *Nut* dry buried in the chaffy bracteoles and glumes, beak small conic, or hardly any

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UPPER ASSAM alt 30(. . . *Scape ro-*
Rhizome long nearly ¼ . . . ellipsoid;
bust sheathed at base by . . . *Squamellæ*
bracteoles ¼ in chaffy . . .
and glumes linear oblong nearly as long as bracteoles, and lateral glume sterile *Style* long, slender branches 3 long *Nut* ⅛ in, ashy black, beak very small, fused with nut

2 **M. palustris,** *Benth in*
scabrous upwards with 10–50 .
scabrous on keel beneath bracte
style 3 fid nut ovoid little narr
Boeck in Linnæa xxxvii 138, .
2, 78 (var malesica) (*not of Hassk*) Lepironia palustris, *Miq Ill Il Archip Ind* 63, t 25

with . . .

3. **M. Kurzii,** *C B Clarke*, scape 4–16 in smooth upwards with 1–15 spikes, leaves 1 in broad aculeate on keel beneath, bracteoles ⅜ in, strongly 13-striate reddish brown

MALACCA, *Griffith* (*Kew Distrib* 6356) PERAK; alt. 1750 ft, *King* PENANG, on Government Hill, alt 1750 ft., *Maingay*, *King*
Rhizome thick *Leaves* densely equitant, very rigid harsh as of a Pandanus; tips long attenuate, trigonous, aculeate *Inflorescence* 1 in diam, rigid, bracts short, ovate, brown *Spikes* ¼ in, ellipsoid, brown *Bracteoles* ovate, obtuse rigid, incurved entire at apex *Squamellæ* nearly as long as bracteole, brown. *Nut* not seen —Closely allied to *M palustris*; spikes and spikelets rather smaller.

4 **M. andamanica,** *C B Clarke*, scape 4–12 in smooth upwards, leaves broad almost flaccid smooth on keel beneath, bracteoles ¼ in.

smooth or obscurely reticulate, disc margin subentire *Nees in Wight Contrib* p 118 S ceylanica, *Kunth Enum* ii 358, *Thw Enum* 435 S Thwaitesiana, *Boeck in Linnaea*, xxxviii 451 S lateriflora, *Boeck l c* 455, *Kurz in Journ As Soc* xlv, pt 2, 159 S hebecarpa, *Thw Enum* p 354, 435

TENASSERIM, *Helfer* NICOBARS, *Kurz* CEYLON *Thwaites* —DISTRIB Borneo
Stems 1 ft, connected at base on a very short slender ligneseent rhizome *Leaves* with scattered slender needle-white hairs or glabrescent, tip lanceolate subobtuse (not setaceous caudate) *Spikelets* small as of *S tessellata* *Nut* scarcely $\frac{1}{16}$ in in diam, dried young reticulate, mature osseous smooth or nearly so *Disc*-margin coloured, glandulose not (or obscurely) 3-lobed —*S laxa*, R Br, hardly differs but by its strictly fibrous roots.

10 **S. flaccida,** *C B Clarke* (*non Steud*), slender, softly hairy all over, roots fibrous, panicles axillary small distant, fem glumes hairy, style 3-fid, nut small ovoid smooth white, disc margin subentire coloured glandular

subtuberculated nut.

*** *Nut smooth, white, fluted longitudinally*

11 **S. caricina,** *Benth Fl Austral* vii 426, annual, very slender, nearly smooth and glabrous panicle of several remote small axillary clusters, fem glume sub 3 toothed, style 3 fid nut very small, disc margin obsolete S axillaris, *Moon Cat Pl Ceylon*, p 62 Diplacrum caricinum, *Br Prodr* 241, *Endl Iconogr* t 25, *Thw Enum* 354, *Boeck in Linnaea*, xxxviii 434 D tridentatum, *Brongn in Duperr Voy* t 26 D zeylanicum, *Nees in Wight Contrib* p 119 Olyra malaccensis, *Kœnig in Herb Heyne* —*Wall Cat* 3540

INDIA, frequent; from the SIKKIM TERAI and ASSAM to CEYLON and TENASSERIM —DISTRIB. Malaya, China Australia
Roots fibrous, slender *Stems* 1–12 in, tufted *Leaves* 2 by $\frac{1}{8}$–$\frac{1}{6}$ in, lanceolate, tip subobtuse, sheaths trigonous, not winged Primary *bracts* (floral leaves) altogether leaf like tuft usually of very small subsessile clusters just exserted from their ... lusters are sometimes paniculate with ... fem $\frac{1}{12}$ in long with 1 or 2 smaller ... en spikelet lowest glume ovate boat ... longer, boat shaped, apex deeply emarginate (from the centre of the emargination the midrib is produced as a linear triangular point), smooth, 2 ribbed on each side, 3rd glume similar to 2nd and subopposite to it, containing fem flower; no rudiment of an upper glume *Nut* scarcely $\frac{1}{20}$ in in diam, disc small obpyramidal, margin most minute, white, truncate —See Goebel in *Ann Jard Buit* vii 132, t 15, figs 21–29, who considers the female flower truly terminal, and therefore places the species among the American *Cryptangieæ*

**** *Nut covered by conical tubercles hairy at their tips*

12 **S. Neesii,** *Kunth Enum* ii 358, small, hairy, rhizome hardly any panicle of 2-1 distant axillary clusters (in Ceylon one terminal head),

spikelets somewhat large lanceolate hairy, style 3 fid nut small globose as though softly glochidiate *Thw Enum* 354 *Boeck in Linnæa*, XXXVIII 449 S stricta *Moon Cat Pl Ceyl* 62 Hypoporum capitatum, *Nees in Linnæa*, IX 303, & *in Edinb Phil Journ* XVII 267, & *in Wight Contrib* 118

CEYLON *Macrae*, &c —DISTRIB Borneo

In the Ceylon specimens—*Stems* 1–3 in *Leaves* lanceolate t p subobtuse *Head* globose, of about 12 spikelets *Spikelets* all unisexual (not a *Hypoporum*) nearly $\frac{1}{8}$ in long, ferruginous, female glume mucronate *Nut* about $\frac{1}{16}$ in *Disc* minute, patent margin as long as contracted base of nut pale, truncate scarcely 3 lobed —The Ceylon specimens (not plentiful) have uniformly small 1 headed specimens but are a small form of a Borneo plant which is a foot high with the lower axillary head of spikelets remote

Sect 2 *Elatæ* Robust plants with thick (except in S *psilorrhiza*) wooly horizontal rhizome. Leaves (in many) caudate setaceous at tip Partial panicles rigid often pyramidal Lobes of disc margin entire [or slightly digitate in S *multifoliata*]

* *Sheaths* (*of middle stem leaves*) *winged* (sometimes in *S elata*, and *S chinensis* obscurely)

13 **S. hebecarpa**, *Nees in Linnæa* IX 303 and *in Wight Contrib* **117**, scarcely robust, slightly hairy (see also var β) panicle thin scarcely rigid style 3 fid nut minutely velvety, lobes of disc margin lanceolate thin brown concavely appl ed to nut *Thw Enum* 435, *Boeck in Linnæa*, XXXVIII 478 S alata *Moon Cat Pl Ceyl* 62 S scrobiculata *Zoll Ver Archip Ind* II 61 (not of *Nees*) S stipularis, *Thw Enum* 353, 435 (*not of Nees*) —Scleria *Wall Cat* 3415

, and CEYLON,

Leaves 1 ft, margins scabrous (cutt
usually long acuminate, occasionally
panicles usually thin lax of few sp
bracts often much exsert conspicuous but sometimes short *Spikelets* all unisexual,
fem
rudim
apex,
lations [illegible]

yp 168, more hairy, sometimes softly
ta *Boeck l c* XXXVIII 482 S villosula,
Miq Fl Ind Bat III 344 (*not of Poir*) —
From Sikkim and Assam to Chota Nagpore, Malaya China —Leaves often softly villous beneath Rhachis of panicles very hairy Spikelets sometimes hairy

14 **S Thomsoniana**, *Boeck in Linnæa*, XXXVIII. 479, robust, glabrous (even rhachis of panicle) partial panicles remote narrow slenderly peduncled, style 3 fid, nut tessellated minutely hairy, lobes of disc margin o very short thickened reflexed yellow brown S khasiana, *Boeck Cyp Nov* II 29 —Scleria, sp 12, *Herb Ind Or H f et T T*

KHASIA HILLS on the southern slope, alt 0–3000 ft from Chela to Lailnat, *J D H & T T*, &c MUNNIPOOR, alt 2500 ft, *C B Clarke*

Rhizome ½ in thick. *Stems* 3 ft, sheaths broadly 3-winged, sometimes obscure winged; ligule glabrate or not, rarely densely hairy. *Panicle* often tinged re lowest peduncle often 6 in *Spikelets* like those of *S hebecarpa*; disc margin alm spongy shortly reflexed as three ears.—Most easily distinguished from *S. elata* the *glabrous* rhachis of the panicles.

15 **S. alta,** *Boeck in Linnæa*, xxxviii 185, robust, glabrous (ev ... mote, style 3 fi ... united at l a

EAST BENGAL, Foot of Khasia Hills, *Griffith J D H & T. T*; Madhupo Jungle *C B Clarke*

Very near *S Thomsoniana*, except the lobes of disc-margin, secondary bra longer, more conspicuous

16 **S. elata,** *Thw Enum* 353, *a* (*excl* C P 825), robust, more less hairy (at least rhachis of panicle), partial panicles distant rig pyramidal style 3 fid, nut tessellated minutely hairy lobes of the dis margin short obtuse or scarcely obtuse triangular *Boeck in Linn* xxxviii 487 S lithosperma, *Roxb Fl Ind* iii 574 (*not of Willd*) ; Hasskarliana, *Boeck in Engler Jahrb* v [1884] 511 Diaphora cochi chinensis, *Lour Fl Cochinch* 709—Scleria *Wall Cat* 3408, A, C

Throughout INDIA (except the N W arid region) alt 0 2000 ft, and CEYLON - DISTRIB Java, China

D scr of Thwaites, C P 3030—*Stem* 3 ft. by ½ in in diam glabrous *Leave* 1 2 ft 1 by ½ in, tip attenuated, margins scabrous, cutting the hand, when dr recurved sheath 3 winged wings broad or narrow, two wings often much broa lest ligule depressed-ovate, hairy *Panicle* 1 ft by 4 in, partial panicles 4 by 3 in ... hairy *Spikelets* numerous, all unisexual

Var *latior*, stouter, stems often 6–9 ft very thick, sheaths ... panicles large dense, spikelets clustered dusky, nut larger white—N E India, alt 0–3500 ft common

Var *decolorans*, robust panicle dark red, nuts larger early discoloured final black purple as are glumes—Sikkim, Khasia, Munnypoor, alt 3 6000 ft, common

17 **S. chinensis,** *Kunth Enum* ii 357, similar to *S elata*, bu ligules with an ovate oblong scarious brown elongation of their margi ⅙–¼ in long *Boeck in Linnæa*, xxxviii 486 S ciliaris, *Nees in Wig Contrib* 117 (*not of Mich*) S scrobiculata, *Moritzi Verz Zoll Pfl* (*not of Nees*)

SINGAPORE

Var *biauric* margin of ligul S elata, *Thw* Ceylon, *Thwait*

18 ... scabrous ... second ... white ...
Fl Hongk 400 (*not S levis*, Retz) S aspera, *Boeck in Linnæa* xxxviii 453

MALAY PENINSULA PERAK, alt 300 ft, *King's Collector* (n 1929)—DISTRIB ...

elata, Thwaites, but differs by being very ... being *scabrous (scarcely hairy)*, and by the ...

19 **S. psilorrhiza**, *C B Cla* ... wiry slender, panicle contracted ... style 3 fid, nut large smooth white, ... thick subreflexed ...

... ut—There is ...

... glabrous. *Panicle* 2 2½ by ⅜ in stout, 0-½ in, secondary bracts ½-1 in filiform ... and *S elata*, *fem glume* aristate. *Nut* ⅛ ... or hairy, disc obpyramidal rigid, puberescent, margin very narrow with rigid yellowish lobes —Quite unlike the five last sp, and is perhaps more allied to *S Stocksiana*

20 **S. oryzoides**, *Presl Rel Haenk* i 201, robust, glabrous, panicle one terminal nearly bractless dense with numerous long suberect branches, spikelets solitary spicate style 3 fid, nut smooth white, disc truncate *Nees in Wight Contrib* 116 *Thw Enum* 353 S latifolia, *Moon Cat. Pl Ceyl* 62 S orizoides *Boeck in Linnæa*, xxxviii 192—*Wall Cat.* 3539

S F INDIA, from ASSAM to CEYLON and to MALACCA—DISTRIB Zanzibar, Malaya Philippines Australia

Stolons long, terete, ¼ in in diam ... *Stems* 3-6 ft scabrous *Leaves* up ... suddenly narrowed, sheath 3 winged ...

... *Fem spikelets* ⅛ in, ... lobes of disc extremely short reflexed (Nees by some error says the perigynium is profoundly 3 lobed ... pressed to the nut)

** *Sheaths* (of middle stem leaves) *triquetrous, not, or very obscurely, winged*

† *Leaves (that is those next below the bracts) almost regularly alternate*

21 **S. Hookeriana**, *Boeck in Linnæa*, xxxviii. 498, robust, *more* ...

pr ... ... of ...

Herb Ind Or H f et T ...

Rhizome ½ in thick. *Stems* 3 ft; sheaths broadly 3-winged, sometimes obscurely winged; ligule glabrate or not, rarely densely hairy. *Panicle* often tinged red; lowest peduncle often 6 in. *Spikelets* like those of S. *hebecarpa*, disc margin almost spongy shortly reflexed *as three ears.—Most easily distinguished from S. elata by the glabrous* rhachis of the panicles.

15 **S. alta,** *Boeck in Linnæa*, xxxviii 485, robust, glabrous (even rhachis of panicle), partial panicles narrow somewhat remote, style 3 fid, nut tessellated minutely hairy, lobes of disc margin 3 united at base appressed to the nut pale green rounded crenate at summit

EAST BENGAL; Foot of Khasia Hills, *Griffith J D H & T T*; Mulhopoor Jungle *C B Clarke*

Very near S *Thomsoniana*, except the lobes of disc margin, secondary bract longer, more conspicuous.

16 **S. elata,** *Thw Enum* 353, *a* (*excl* C P 825), robust, more or less hairy (at least rhachis of panicle), partial panicles distant rigid pyramidal style 3 fid, nut tessellated minutely hairy lobes of the disc-margin short obtuse or scarcely obtuse triangular *Boeck in Linnæa*, xxxviii 487 S lithosperma, *Roxb Fl Ind* iii 574 (*not of Willd*) S Hasskarliana, *Boeck in Engl r Jahrb* v (1884) 511 Diaphora cochinchinensis, *Lour Fl Cochinch* 709 —Scleria *Wall Cat* 3408, A, C

Throughout INDIA (except the N W arid region) alt 0 2000 ft., and CEYLON — DISTRIB Java China

Descr of Thwaites, C P 3030.—*Stem* 3 ft. by ¼ in in diam glabrous *Leaves* 1 2 ft by ½ in, tip attenuated, margins scabrous, cutting the hand, when dry recurved, sheath 3-winged wings broad or narrow two wings often much broadest, ligule depressed ovate hairy *Panicle* 1 ft by 4 in, partial panicles 4 by 3 in, branches rectangularly divaricate red, hairy *Spikelets* numerous all unisexual, male and fem scattered in all parts of infl; panicle dense, but spikelets scarcely clustered *Fem spikelets* ¼ in, fem glume shortly mucronate glabrous, sterile superior glumes tabescent (generally present) *Nut* $\frac{1}{8}$–$\frac{1}{10}$ in, as of S *hebecarpa* and similarly becoming glabrate ultimately white or dusky, lobes of disc margin scarcely attaining ¼ height of nut ferruginous or red —Thwaites says of his S *elata* "sheaths not winged," whereas Boeckeler puts it in his section having "truly winged sheaths" The explanation is that Thwaites described S *elata* mainly from C P 825 (which is S *chinensis* Kunth, var β), while Boeckeler describes C P 3030

[illegible]

0–3500 ft, common

Var *decolorans*; robust, panicle dark-red, nuts larger early discoloured finally black purple as are glumes —Sikkim, Khasia, Muneypoor, alt. 3–6000 ft, common

17 **S. chinensis,** *Kunth Enum* ii 357, similar to S *elata*, but ligules with an ovate oblong scarious brown elongation of their margin ⅓–½ in long *Boeck in Linnæa*, xxxviii 486 S ciliaris, *Nees in Wight Contrib* 117 (*not of Mich*) S scrobiculata, *Moritzi Verz Zoll Pfl* [illegible] (*not of Nees*)

25 **S. bancana,** *Miq Fl Ind Bat Suppl* 602, robust, nearly glabrous, partial panicles dense approximate subcoalescent branches ascending; spikelets dusky stramineous, style 3 fid nut ovoid apiculate reticulate, lobes of disc margin 3 ovate triangular auricles reflexed S macrophylla, *Presl Rel. Haenk* i 200, *Nees in Wight Contrib* 116 S malaccensis, *Boeck in Linnæa*, xxxviii 507 —Scleria *Wall Cat* 3109

TENASSERIM, *Kurz* MALACCA, *Griffith* SINGAPORE, *Wallich* —DISTRIB. Borneo Tonkin

Rhizome woody ⅓ ⅙ in diam *Stems* 2 4 ft *Leaves* (upper approximated in pairs) 12 18 by ½ in tip lanceolate subobtuse, sheath triquetrous sometimes narrowly 3 winged *Panicle* uninterrupted in Indian examples (in Borneo lowest partial panicle is sometimes 5 in distant) secondary bracts long, linear, conspicuously exsert *Spikelets* nearly as of *S elata* *Nut* $\frac{1}{12}$ in in diam, white or straw colrd, minutely hairy, ultimately glabrate, lobes of disc margin reaching to ¼ height of nut, adpressed, pale

26 [illegible]
glabrou [illegible]
3 fid, n [illegible]
triangu [illegible]
3410 (*partly*), 3411 (*partly*)

RANGOON and TAVOY, *Wallich* SINGAPORE, *Griffith*, &c.—DISTRIB Malay Islds

Leaves (next below lowest bract) in (false) whorls of 2 or 3, tip setaceous, margins scabrous cutting the hand, sheaths not winged Nut-bearing *spikelets* somewhat obovoid *Nut* $\frac{1}{10}$ in long rather narrower than in adjacent species, often ultimately dark red, shining or subviscid Margin of *disc* cup shaped at base, its 3 lobes thick red adpressed sometimes entire often crenulate occasionally their edge cut into short oblong blunt lobes terminated by glands (approaching sub-gen *Schizolepis*) —Most readily distinguished from *S sumatrensis* by the narrowed base of the fruiting spikelet

Var *pilosa* [illegible]
spikelets fuscou [illegible]
Steud) —Pena [illegible]
white (King), [illegible]
hairy

Var *ophirensis*, panicles fuscous, lower peduncles long, male spikelets narrow, lobes of disc-margin shorter (than in *S multifoliata* type), pale —Malacca; summit of Mt. Ophir, alt 5000 ft., *Hullett* (n 860) —A very coarse rigid form, which might be treated as a species.

27 **S. sumatrensis,** *Retz Obs* v 19, t. 2, robust, nearly glabrous, partial panicles pyramidal brown or red, style 3 fid, nut globose reticulate often finally discoloured lobes of disc margin very large attaining ⅓–½ height of nut obtuse *Nees in Wight Contrib* 116 *Thw Enum* 353, *Boeck in Linnæa* xxxviii 513, *Kurz in Journ As Soc* xlv, part 2, 1 9 S setigera *Roxb Fl Ind* iii 575 S purpurascens, *Steud Syn. Cyp* 169 —Scleria *Wall Cat* 3407 (*partly*) 3408 B, 3413

S BENGAL to SINGAPORE, frequent NICOBARS, *Kurz* PENANG, *Wallich*
[illegible] easily distinguished by the broad [illegible] *bracts* 1 in, filiform, often con- [illegible] pale or brown, or often dark red [illegible] rly enveloping the nut, truncate

28 **S. levis,** *Retz Obs* iv 13, robust nearly glabrous, partial panicles pyramidal rigid brown, style 3 fid, nut globose smooth white, lobes of disc margin 3 ovate pale spreading attaining scarce ⅓ height of nut S lævis, *Willd Sp Pl* iv 314, *Roxb Fl Ind* iii 575, *Nees in Wight Contrib* 117, *Kunth Enum* 354, *Boeck in Linnæa*, xxxviii 512, *Kurz in Journ As Soc* xlv, part 2 [1876] 160 S zeylanica, *Moon Cat Pl Ceyl* 62 (*fide Trimen, not of Poiret*)—Scleria, *Wall Cat* 3410 (*partly*), 3411 (*partly*)

From ASSAM to SINGAPORE, alt 0–1000 ft NICOBARS, *Kurz* CEYLON—DISTRIB Java, Hongkong

Similar to *S sumatrensis* and *S multifoliata*, but generally easily distinguished

Sect 3 SCHIZOLEPIS (Genus), *Nees in Mart Fl Bras* ii (pars 1) 158, 186 (char extended) Character of *Hypoporum*, but rim of disc margin with numerous triangular or lanceolate teeth

Boeck in Linnæa, xxxviii 515 Macrolomia bracteata, *Nees l c* 182, t 24

TROPICAL AMERICA, abundant

UNDETERMINED SPECIES OF *Scleria*

SCLERIA RINKIANA, *Boeck Cyp Nov* ii 30—PENANG, alt 2500 ft, *Rink*—"Allied to *S tessellata*, Willd," Boeck.

27 KOBRESIA, *Willd*

caring grass like
nal spike, or (in
(apparently often
Spikelets male,
em glumes (tho
le of *Carex*, its margins in
eir upper half free, forming
bisexual spikelets encloses
pikelet) *Style* 3 fid (in *K*
glume, oblong or narrowly
ecies 20, N temp region

Sect. I HEMICAREX (Gen) *Benth in Gen Pl* iii 1072 (*chiefly*) Stem with 1 apparently simple linear or oblong spike *Fem spikelets* 1 fld, with sometimes the rudiment of rhachilla within fem glume *Style* 3 fid

1. **K. seticulmis,** *Boeck in Linnæa*, xxxix 3 *partly* (*char ref rm*), stems slender 2–8 in, vernal leaves flat linear-lanceolate tipped, spikes $\frac{1}{2}$–1 in linear fem or fem at base male at top, fem glume deeply split style 3 fid, nut (including exserted beak) $\frac{1}{12}$ in Hemicarex Hookeri *C B Clarke in Journ Linn Soc* xx 383 (*partly*) Carex (*better Kobresia*) mutans, *Boott ms* —Elyna sp 2, *Herb Ind Or H f. & T T*

SIKKIM, alt 12 13,000 ft, Lichen Valley, at Momay, *J D H*

Rhizome very short, woody, roots long, thick, tough *Stems* cæspitose. Vernal *leaves* 2 by $\frac{1}{12}$ in, summer 5–8 in, tip long caudate, filiform, scabrous, sheath testaceous, becoming brown not fimbriated *Spikes* $\frac{1}{12}$ in broad, bracteoles (corresponding to "glumes" of carex) rhomboid ovate, brown, yellow on back, lower often more or less aristate, upper obtuse *Glume* (i e utricle), subspathiform, at top obliquely truncate, with 2 green ribs, a minute rudiment of rhachilla is sometimes within it *Nut* linear-oblong, brown, as long as glume, beak $\frac{1}{3}$–$\frac{1}{2}$ length of nut, exsert —Boeckeler united with *K seticulmis, filicina*, and his description of *seticulmis* is mainly drawn from *filicina* (he had only a scrap of *K seticulmis*)

2. **K. Hookeri,** *Boeck in Linnæa*, xxxix 4, stems rather slender 4–12 in, vernal leaves flat linear-lanceolate tipped, spikes (all fem at base male at top but see var β) $1\frac{1}{4}$–$1\frac{3}{4}$ in linear, narrower interrupted at base, fem glume deeply split style 3 fid, nut (including exserted beak) $\frac{1}{8}$ in Carex Esenbeckii? *Boott ms* (*not of Kunth*) Hemicarex Hookeri, *C B. Clarke in Journ Linn Soc* xx 383 (*partly*), t 30, figs 3, 4

SIKKIM, alt 1

Closely allied broad;
summer leaves 1 er are
short, surrounded greatly
elongated, with long-caudate summer leaves

Var ? β *dioica*, spikes (very many seen) unisexual —SIKKIM, Namdee, alt. 12,000 ft, *Pantling* —Male spikes 2 by $\frac{1}{6}$ in Fem spikes 2 $2\frac{1}{2}$ in, in two examples branched These are spring examples, and may be *K. Hookeri*, or a new species allied thereto

3 **K. angusta,** *C B Clarke*, stems slender 1–5 in, all leaves very narrow, spikes diœcious males short (on short stems) sublanceolate fem (on elongating stems) linear filiform interrupted at base, style 3 fid, nut nearly as in *K seticulmis*, but beak shorter

SIKKIM, Sundukphoo, alt 12,000 ft, *C. B Clarke*

Vernal leaves 2 by $\frac{1}{16}$ in, summer leaves 4–5 in *Male stems* 1–2 in, male spikes $\frac{1}{3}$–$\frac{1}{2}$ by $\frac{1}{8}$–$\frac{1}{6}$ in, male bracteoles elliptic-lanceolate, brown, back green, edges scarious *Fem stems* ultimately 4–5 in, fem spikes (young) $1\frac{1}{4}$ by $\frac{1}{16}$ in.

4. **K. vaginosa,** *C B Clarke*, culms 4–8 in. clothed some way up by withered sheaths, leaves all filiform, spikes (mostly diœcious) male linear-oblong fem linear with distant bracteoles, style 3 fid, nut linear-oblong, beak $\frac{1}{3}$ length of nut

SIKKIM, Lichen Valley, at Momay, alt 15,000 ft, *J D H.*

Stems covered up to $\frac{1}{3}$–$\frac{1}{2}$ their length by scarious flaccid sheaths. *Leaves* 2–6 in, at base scarcely $\frac{1}{25}$ in broad *Male stems* about as long as female *Male spikes* $\frac{1}{2}$ by $\frac{1}{10}$ in *Fem spikes* (sometimes having male spikelets at top) 1 in, most of the bracteoles (except a few at top) not imbricated

5 **K. trinervis,** *Boeck in Linnæa*, xxxix 548, *in note*, stems 2 8 in. rather slender, summer leaves very long not long-caudate, spikes (usually diœcious) fem $2\frac{1}{2}$ in. linear, male bracteoles elliptic-oblong obtuse

Lower spikelets mostly 2 fld i e lower fem , upper male *Nut* nearly as long as glume , beak ⅓ length of nut

10 **K. Duthiei,** *C B Clarke*, stems medium sized rigid, spikes linear dense green, style 3 fid, nut small narrowly obovoid, beak short scarcely overtopping glume

KUMAON, alt 11-16 000 ft , *Duthie* (nn 3461, 6093, 6094) and Gurwhal (n 5016)

Stems densely cæspitose, 4-8 in , striate lower sheaths tight, not lacerate *Leaves* many ⅓-½ length of stem, ½ in broad flat, t p caudate *Spikes* 1 by 1/12 in , very rigid , bracteoles 1/8 in ovate closely spirally imbricated *Spikelets* mostly 2 fl upper flower male. *Nut*, including beak, about as long as glume, beak ⅓ length of nut

11 **K. capillifolia,** *C B Clarke in Journ Linn Soc* xx 378, somewhat slender leaves linear setaceous sheaths chestnut colour somewhat torn, spikes linear, bracteoles obtuse erect margins scarious, style 3 fid, nut ellipsoid (scarcely obovoid) narrowed at top into linear style K scirpina, *Boeck in Journ Linn Soc* xviii 104 and xix 90 K elata and K brunnescens, *Boeck Cyp Nov* i 32 40 Elyna capillifolia, *Decne in Jacquem Voy Bot* 173, t 174 E spicata, *Boiss Fl Orient.* v 394 — Elyna, sp n 6, *Herb Ind Or H f & T T*

KASHMIR to GURWHAL alt 10-12 000 ft , frequent, *Jacquemont, T Thomson, &c* KURRUM VALLEY, alt 12 500 ft , *Aitchison*

Stems 2-12 in *Spikes* ⅔-1 by ⅙-¼ in , brown chestnut colour or yellow, bracteoles ⅙ in *Spikelets* mostly 3-4-fld. *Nut* shorter than glume —Very near the European *K scirpina*, Willd , but is a finer plant, with a brighter thicker spike.

12 **K. schœnoides,** *Boeck in Linnæa*, xxxix 7, stems stout rigid, leaves linear channelled incurved, sheaths shining brown very little torn, spikes oblong dense, bracteoles ⅙ in elliptic oblong obtuse, style 3 fid, nut obovoid obtuse, beak small linear *Aitch in Journ Linn Soc* xix 190, *C B Clarke in Journ Linn Soc* xx 378 (*not of Henders*) K sibirica, *Boeck in Linnæa* xxxix 7 K Royleana, *Henders Yarkand* 339 (*not* Trilepis Royleana, *Nees*) Elyna schœnoides, *C A Meyer in Ledeb Fl Alt* iv 235 (*in note*), *Kunth Enum* ii 534, *Strachey Cat Pl Kumaon*, 73, *Boiss Fl Orient* v 394 E Sibirica, *Turcz in Bull Soc Imp Mosc* (1838) 103

HIMALAYA , alt 10-16 000 ft from W TIBET, *Thomson*, to SIKKIM, *J D H* — DISTRIB Caucasus, Central Asia, Siberia

Rhizome woody, short *Stems* 4-24 in 1/12-⅛ in diam *Leaves* as long as stems, to scarcely ⅓ of stem, 1/12-⅛ in broad *Spikes* ½-1 by ⅛ in , bracteole chaffy, loosely imbricated, suberect *Spikelets* 1-5 fld , lowest fl fem , or towards top of spike wholly male *Nut* 1/12 in , ashy black.

13. ... oc xx 379, t 30, fig 7, ... eaths testaceous brown ... n ovate obtuse shining, ... rous

WEST HIMALAYA, alt 12-15,000 ft , Kashmir, *C B Clarke*, Kumaon and Gurwhal *Duthie*

Stems 2-10 in *Leaves* overtopping stem *Spikes* ½ by ⅛ in *Bracteoles* shining chestnut colour, paler on back, margins often white scarious. *Nut* 1/12 in , very like that of *K schœnoides*

Sect 3 EUKOBRESIA *Spike* on each stem 1, linear oblong or ovate, compound subpaniculate, dense or interrupted at base (but smaller simple spikes occur in most species occasionally) *Lower spikelets* bisexual except in *C uncinoides* *Style* 3-fid —Trilepis, *Nees in Edinb N. Phil J urn.* xvii 267 (*as to type species*)

14 **K. Royleana,** *Boeck in Linnæa,* xxxix 8, stems somewhat stout, leaves linear flat when dried, spikelets medium-sized purple green or ferruginous brown, style 3 fid nut ellipsoid attenuated into beak K stenocarpa *C B Clarke in Journ Linn Soc* xx 380 K schœnoides, *Henders Yarkand,* 339 (*not of Boeck*) Trilepis Royleana, *Nees in Edinb N Phil Journ* xvii 267 and *in Wight Contrib* 119, *Kunth Enum* ii 535, *Strachey Cat Pl Kumaon,* 73 Elyna stenocarpa, *Karel & Kiril in Bull Soc Imp Mosc* xv (1842) 526

ALPINE HIMALAYA, alt 10–16 000 ft, from W TIBET, *Thomson,* to SIKKIM, *J D H*, frequent —DISTRIB North Cabul, Central Asia

Stem in Royle's specimens scarcely 4 in, in Thomson's 2 ft *Leaves* sometimes as long as stem, often very much shorter very variable in width ($\frac{1}{12}$–$\frac{1}{4}$ in) *Spikes* (in Royle's) $\frac{3}{4}$ by $\frac{1}{4}$ in in Thomson's up to $2\frac{1}{2}$ in, panicled, branches sub re t with many spikelets, ferruginous brown Lower spikelets $\frac{1}{2}$ in, often 3–4 fld *Nut* $\frac{1}{12}$ in —The large series of dried examples appears to unite Royle's (the type) with the fine collections of Thomson Closely allied to the English K caricina, Willd, but has, in general, much larger brighter spikes

K. [illegible]

109 —Triticoides *Griff Itin Notes,* 140

SIKKIM, alt 10 16 000 ft, *J D H,* &c BHOTAN, *Griffith* —DISTRIB Tibet

Glabrous *Rhizome* 3 [illegible] *Stems* 1–2 ft, striate *Leaves* sub basa[illegible] by $\frac{3}{4}$ in, stiff yellow, somewhat inter[illegible] $\frac{3}{4}$ in by $\frac{1}{16}$ in, brown, delicately striate [illegible] tened shallowly lacerate on one side split [illegible] in young state nearly to base of nut Rudiment of the spicule exserted out of mouth of utricle r[illegible] the slit fold over[illegible] c power It is a[illegible] it hardly differs [illegible]rger size

Sect 4. HEMICAREX (Genus), *Benth in Gen Pl* iii 1072 (*partly*) *Spikes* loosely panicled, lowest bract long, leaf like *Style 3* fid

16 **K. laxa,** *Boeck in Linnæa,* xxxix 6, stems 8 24 in rather slender, spikes 1- or 2 sexual (lowest spikelet fem), style 3 fid, nut narrow oblong apiculate scarcely beaked K pseudo laxa, *C B Clarke in Journ Linn Soc* xx 381 Cobresia laxa, *Nees in Wight Contrib* 119, Elyna? laxa, *Kunth Enum* ii 534 Hemicarex laxa, *Benth Gen Pl* iii 1072, *C B Clarke l c* 385, t 30 Carex impunctata, *Boeck in Linnæa,* xl (1876), 343 (*the Himal plant*)

ALPINE HIMALAYA, alt 6000–12 000 ft., from N W KASHMIR, *Giles,* to SIKKIM, *J D H*

Rhizome creeping, short *Leaves* as long as stem, $\frac{1}{12}$ in broad, grass-like. *Panicle* 2–4 in long, narrow, branches slender erect, sometimes wholly fem, rarely wholly male. *Fem spikes* long, slender, with lanceolate distant spikelets, bracteoles not imbricated, style branches conspicuous exsert *Fem spikelets* usually 1-fld, sometimes an upper male fl added *Male spikelets* 3–several-fld. *Style* linear, hardly ½ length of nut, branches 3, linear very long

17 **K. curvirostris,** *C B Clarke*, stems 1–6 in slender, spikes (all seen fem) densely panicled nut narrowly oblong, beak cylindric exsert curved Hemicarex curvata, C *B. Clarke in Journ Linn* Soc. xx. 381 — Elyna sp n 10, *Herb Ind Or Hf & T T*

SIKKIM, Tungu, alt 13,000 ft, *J D H*

Leaves as long as stem, $\frac{1}{12}$ in broad. *Panicle* 1 by ⅓ in —Resembling, and closely allied to, *K laxa*

Sect 5 PSEUDOKOBRESIA. *Style* 2-fid *Nut* flat

18 **K. macrantha,** *Boeck Cyp Nov* i 39, spike ovoid compound, spikelets clustered mostly 3–5 fld lowest flower female, glume split to base, margins not overlapping K filifolia, *C B Clarke in Journ Linn Soc* xx 381 Elyna filifolia, *Turcz Fl Baical Dahur* ii part i 238 (*from descript*)

W TIBET, Nubra, *Schlagintweit* (n 2424) and Ladak (n. 1344) —DISTRIB. Central Asia

Rhizome short *Stems* cæspitose, 2 7 in *Leaves* many, ½ length of stem, $\frac{1}{20}$–$\frac{1}{10}$ in broad flat, sheaths pale, not torn *Spike* ⅔ by ½ in *Bracteoles* ¼ in, ovate-oblong, obtuse, nearly flat, brown with green back *Fem glume* elliptic-oblong, obtuse, concave, open (nowise utricle-like) *Nut* $\frac{1}{10}$ in, obovoid, obtuse, brown, style linear, ⅔ length of nut, branches 2, long, linear

28 CAREX, *Linn*

Characters of Kobresia, but utricle enclosing nut bottle shaped, mouth of its beak entire notched or shortly slit —Species 1100 throughout the world, less abundant in dry or very hot regions

The so called "glumes" of *Cariceæ* are not homologous with the fl glumes of *Scirpeæ* The male spike is here considered homologous with the female spike; i e not as by Eichler and others who consider in *C dioica* the male plant to bear a simple spike, the fem plant to bear a compound spike.

CONSPECTUS OF SECTIONS OF CAREX (exceptions omitted).

Subgenus I. VIGNEA. Style 2-fid

* . . . . sp. 1–10
** . . . . sp. 11–14

* Spikes short, ovoid or oblong (*C remota*, &c.) . . . . . sp. 15–18
** Spikes linear-cylindric (C. *teres*, &c.) . . . . sp 19–22
Sect 3 *Vulgares* Terminal spike wholly male (*C vulgaris*, &c) . . . . sp. 23–33

Subgenus II EUCAREX Style 3 fid.

Sect.

Sect

** Spikes short, very numerous (*C cruciata* &c) . . sp 43–66

*** Spikes long-cylindric Peduncles mostly solitary (*C Myosurus*, &c) . . sp 67 73

**** Spikes long cylindric Peduncles often several from each lower sheath Terminal spike sometimes wholly male (*C polycephala*, &c) . sp 74 84

***** Species not easily placed in any one of the preceding 4 subsections (*C curticeps*, *C speciosa*, *C fragilis*, &c) . . . sp 85–91

Sect 6 *Atratæ* Terminal spike male at base fem at top (*C atrata*, &c) . . sp. 92 98

Sect 7 *Propriæ* Terminal spike wholly male (in the first . . . umerous,

sp 99–105

** sp 106–125

*** &c) sp. 126–142

Subgenus I VIGNEA (Genus) *Beauv in Lestib Essai Cyp* 22 Styles 2 fid, in *C stenophylla* rarely 3 fid

[N B—In Subgen *Eucarex*, in the Indian species, 2 fid styles occur in 2 or 3 species in the upper part of the spike, or in poorly-developed spikelets]

Sect. 1 MURICATÆ Terminal spike (and usually some or many of the others) fem at base male at top [Spikelets in *C fluviatilis* all or mostly 1 sexual, monœcious or diœcious]

* Spikes short ovoid or oblong, sessile or nearly so, in a dense or interrupted compound spike [The series of species proceeds from the dense to the more interrupted]

1, rhizome descend
op forming one ovoid
style 2 fid, utricle

56

Glumes obtuse, margins shining,
ather longer than glume, larger than
fid, hyaline ultimately at top. *Nut*
Style ½ nut, branches long exsert

2 C.
112,
form

edged, style 2-fid, utricle ellipsoid acuminate ultimately thick crustaceous blackish obscurely nerved, beak short scabrous on margins *Kunth Enum* ii. 374, *Reichb Ic Fl Germ* viii 5, t 200, fig 534, *Boott Carex*, iv 200
r, xxxix p 50 and *in Journ Linn Soc*
hk Riedgr* i (1801) 26 and ii 6, t 6,
a, *Host Gram Austr*) i 34, t 44 (*non*
ula, *C A.*
n ii 374
derss Cyp
Fat ser 2,
Kobresia
Yarkand,

339 —Carex s

8–

th
pr
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el
black crustaceous
roughness of stem, breadth and incurving of leaves, &c, mentioned carefully by European authors, were found not to be valid by Boott

3 **C. divisa,** *Huds Fl Angl* 348, rhizome horizontal, spikes ovoid androgynous male at top forming one ovoid or oblong or interrupted compound spike, glumes brown, style 2 fid, utricle ovoid acuminate stout moderately nerved, beak short scabrous on margins *Good in Trans Linn Soc* ii 157, t 19 fig 2, *Kunth Enum* ii 372, *Reichb Ic Fl Germ* viii 7, t 205, fig 545 *Boott Carex*, iv 186 and *Ic Ined* 631, *Boeck in Linnæa*, xxxix 55 and *in Journ Linn Soc* xviii 105 C rivularis, *Schk Riedgr* i 30, t Cc fig 87 C austriaca, *Schk l c* ii 10, t Qqq fig 157. C Bertolonii, *Schk l c* ii 5, t Dfg 18 and t Rrrr, fig 202 C coacta, *Boott in Proc Linn Soc* i (1846), 285 and *in Trans Linn Soc* xx 133. C curaica, *var γ* coarcta, *Boott Carex* iv 204 C curaica, *Boiss Fl. Orient.* iv 402

eaves often ½ stem, narrow,
terrupted at base (in well-
sometimes overtopping infl
Fem glumes ovate, hardly mucronate, brown, scarious margin narrow *Utricle* greenish or yellowish, ultimately brown, somewhat thickened, nerves 5–7 on plane face, slender, 11–13 on convex face rather stronger, beak shortly bifid.—Much stouter than *C incurva* and *C stenophylla*, and utricles longer Resembles gener-

India

many-nerve l without glands acuminated into a short rough edged beak. *Boeck in Linnæa*, xxxix 93

UPPER BURMA; Wullaboom in Hookloom, *Griffith* (*Kew Distrib* n. 6103) — DISTRIB China, Japan

Rhizome woody. *Stems* 1–2 ft *Infl.* 4–6 by ½–⅔ in, dense, of 40 70 spikes, lowest bract scarcely 1 in *Spikes* nearly ½ in, straw colrd *Utricle* (larger than ... eak ... nd ... in ...) as occurs in *C distichа*

... Soc n 163 (*excl tab* ... long as stems narrow, ... een variegated brown ... e style 2 fid, utricle ... gibbous few nerved ... lmost winged *Schk* ... 0, *Boeck in Linnæa*, xxxix 104 C terctiuscula, var. β major, *Boott Carex*, iv 145, t 466 C mitis, *Boeck l c* 104

KASHMIR, alt 6–70 0 ft *Thomson* BHOTAN, *Griffith*, n 2633 (*Kew Distrib* n 6104) — DISTRIB Cooler N Hemisphere

Griffith's example shows no root, but is in ripe fruit, the utricle has a ridge on the nerveless face and about 4 nerves on the middle of the turgid gibbous face, exactly as in European *C tereticuscula* Thomson's Kashmir plant has numerous stems closely placed on an intricately branched short weak rhizome, the young utricles are stalked and show the subulate margins of the beak I put these two plants together, for they must be very closely allied, Mr J G Baker says that neither of them matches exactly *C tereticuscula*

** Spikes linear cylindric, peduncled, inflorescence loose

11 **C longipes,** *Don in Trans Linn Soc* xiv 329, & *Prodr* 43, infl long very lax, lowest peduncle solitary usually 1 spiked long, fem glumes mucronate some aristate, style 3 fid utricles green or fully ripe yellowish *Nees in Wight Contrib* 124, *Kunth Enum* ii 418, *Drejer Symb Caric* 24, t 10, *Boott Carex*, iv 190 *Ic Ined* t 644, *Boeck in Linnæa*, xl 376 (*not of Thwaites*) — Carex, *Wall Cat* 3388

NEPAL, SIKKIM, and KHASIA, alt 4–12 000 ft, common — DISTRIB China

Rhizome short, woody, divided *Stems* 6–24 in, slender *Leaves* ¾ the stem, ⅙ in broad Cauline *sheaths* distant, lowest often near base of stem Lowest *peduncle* usually ex ... nodding *Spikes* 3 10 on each stem, ... lowest with 1 or 2 smaller near base ... excurrent mucro, anther submut cou ... luced into a rough bristle often overtop ... or ellipsoid, suddenly narrowed into ... face glabrous or scabrous on margin sometimes also on two marginal nerves (see var β) beak narrowly oblong deeply bifid 1 bes lanceolate erect scabrous or rarely glabrous on margins *Nut* much flattened, ⅔ utricle (with beak), ovoid, obtuse, dark brown, style little thickened, exsert branches shorter than utricle

Var β *nepalensis*, Boott Carex, iv 190 utricles scabrous p lose over both faces C macrolepis, *Don in Trans Linn Soc* xiv 329 & *Prodr* 42 (*not of DC*) C nepalensis, *Spreng Syst* iii 811, *Nees in Wight Contrib* 125, *Drejer Symb*

Caric 23, t. 9, *Kunth Enum* ii 391 —Carex *Wall Cat* 3388 (*largely*) —Nepal *Wallich*.—Kept up as a species by Drejer and Nees working with one or two pieces only A good series of material shows a transition from the perfectly glabrous utricle (through forms with one or two marginal nerves scabrous) to the very scabrous utricle, and both Boeckeler and Boott unite the two

Var γ *dissitiflora*, stouter with broader leaves and longer utricles lowest peduncle usually very shortly exsert spikes elongate very slender the lower utricles solitary, distant —*Nilghiri* alt. 6 7000 ft, *Wight*, *C B Clarke* Anamallays *Beddome* Khasia, alt. 5 6000 ft., *C B Clarke* —Perhaps a distinct sp according to *Drejer Symb Caric* 24 Lowest peduncle often carrying *2 or 3 spikes* The Nilghiri plant appears a distinct species, but the Khasia series shows a complete transition from var γ *dissitiflora* to typical *C longipes*

12 **C. brunnea,** *Thunb Fl Japon* 38 infl long lax, lowest peduncle

about as long as utricle *Schk Riedgr* ii 16 t Xx fig 111 *Kunth Enum* ii 392, *Boeck in Linnæa* xxxix 145 C gracilis, *Br Prodr* 242, *Boott Carex*, i 59, tt 154 155 156 [excl syn C lachnosperma *Wall*] *Thw Enum* 355 C flexilis *Don Prodr* 42, not of Rudge C lenta *Don in Trans Linn Soc* xiv 327 *Kunth l c* 418 C nepalensis, *C B Clarke in Journ Linn Soc* xxv 82 not of Spreng

N W Himalaya alt 4000–6000 ft frequent Muneypoor alt. 3700 ft, *C B Clarke* Assam, *Griffith* Sind *Pinwill* Pulney and Nilghiri Hills alt 6–7000 ft *Wight &c* Ceylon alt 5000 ft *Thwaites* —Distrib The Mascarene

leaves ; stem ⅛ *in broad* Cauline middle of plant *Peduncles* often slender nodding sometimes bearing 3 10 spikes *Spikes* 1½ 2 i slender Male *glumes* obtusely triangular, reddish-brown Fem *glumes* ovate apex triangular ultimately ferruginous brown *Utricle* rather small not parallel sided 9 15 nerved on each face minutely hairy on nerves,

the inflorescence

13 **C. teinogyna,** *Boott Carex* i 60, t 158 infl long lax, peduncles often 2 or more from one sheath bearing 1 or few spikes, fem glumes acute often mucronate ripe utricle brown oblong much flattened striate, beak linear long deeply bifid, style 2 fid branches longer than utricle *Boeck in Linnæa*, xxxix 145

, *Griffith* &c
slender plant with narrower leaves.
narrowed into a linear beak nearly as
minutely scabrous pilose on all the
margins or near the top very rarely
wanting, lobes of beak erect Nut oblong filling utricle Branches of *style 2*, very long, brown red, persistent on ripe fruit.

14 **C. longicruris,** *Nees in Wight Contrib* 124, infl long lax, peduncles often 2 or more from one sheath bearing 1 or few spikes, fem

many-nerved without glands acuminated into a short rough edged beak *Boeck in Linnæa*, xxxix 93

UPPER BURMA, Wullaboom in Hookhoom, *Griffith* (*Kew Distrib* n. 6103) — DISTRIB China, Japan

Rhizome woody. *Stems* 1–2 ft *Infl.* 4–6 by ½–⅔ in, dense, of 40–70 spikes lowest bract scarcely 1 in *Spikes* nearly ½ in, straw colrd. *Utricle* (larger than in *Thomsoni*) plane convex, nerves 8 on the plane, 12 on the convex face, beak minutely scabrous on edges — very near *C Thomsoni*) but much less rigid, the infl in fruit resembles that of *Setaria italica* It is sometimes completely diœcious, in other cases the infl has male spikes in the middle firm at both ends (or at top only) as occurs in *C disticha*

10 **C. teretiuscula,** *Good in Trans Linn Soc.* ii 163 (*excl tab cited*), stems 2 ft scabrous at top, leaves nearly as long as stems narrow, spikes ovoid or ellipsoid androgynous male at top green variegated brown forming a linear oblong interrupted compound spike, style 2 fid, utricle small stalked slightly spongy ovoid conical beaked gibbous few nerved on convex face, margins of beak serrate subhyaline almost winged *Schk Riedgr* i 30, tt. D 19, & T 69, *Kunth Enum* ii 390, *Boeck in Linnæa*, xxxix 104 C teretiuscula, var. β major, *Boott Carex*, iv 145, t 466 C mitis, *Boeck l c* 104

KASHMIR, alt 6 70 0 ft *Thomson* BHOTAN, *Griffith*, n 2653 (*Kew Distrib* n 6104) — DISTRIB Cooler N Hemisphere

Griffith s example shows no root, but is in ripe fruit, the utricle has a ridge on the nerveless face and about 4 nerves on the middle of the turgid gibbous face, exactly as in European *C teretiuscula* Thomson's Kashmir plant has numerous stems closely placed on an intricately branched short weak rhizome, the young utricles are stalked and show the subulate margins of the beak I put these two plants together, for they must be very closely allied, Mr J G Baker says that neither of them matches exactly *C teretiuscula*

** Spikes linear cylindric, peduncled, inflorescence loose

11 **C longipes,** *Don in Trans Linn Soc* xiv 329 & *Prodr* 43, infl long very lax, lowest peduncle solitary usually 1 spiked long, fem . . . yle 2 fid utricles green or fully ripe . . . 124, *Kunth Enum* ii 418, *Drejer* . . . , iv 190 *Ic Ined* t 644, *Boeck in* . . . 'arex, *Wall Cat* 3388

NEPAL, SIKKIM, and KHASIA, alt 4–12,000 ft., common — DISTRIB China

Rhizome short, woody divided *Stems* 6–24 in, slender *Leaves* ⅔ the stem, ⅙ in broad Cauline *sheaths* distant, lowest often near base of stem Lowest *peduncle* usually exsert 2–8 in (but see var γ), almost filiform, nodding *Spikes* 3–10 on each stem, 1–3 in, green or yellowish, usually solitary or lowest with 1 or 2 . . . nute rough excurrent mucro, . . . mucro produced into a rough . . . tened, ovoid or ellipsoid sud . . . ved on each face glabrous or . . . l nerves (see var β) beak . . . rous or rarely glabrous on . . . void, obtuse, dark brown, . . .

Var β *nepalensis* Boott Carex, ii 190, utricles scabrous pilose over both faces C macrolepis, *Don in Trans Linn Soc* xiv 329 & *Prodr* 42 (*not of DC*) C nepalensis, *Spreng Syst* iii 811, *Nees in Wight Contrib* 125, *Drejer Symb*

Caric 23, t 9, *Kunth Enum* ii 391 —Carex *Wall Cat* 3 ... *Wallich*.—Kept up as a spec es by D ejer and Nees worki... only A good series of material shows a transition from the ... utricle (through forms with one or two marginal nerves scabrous) ... brous utricle, and both Boeckeler and Boott unite the two

... ong pes

12 **C. brunnea,** *Thunb Fl Japon* 38 infl long lax, lowest peduncle often several spiked often 2 or more from one sheath fem. glumes acute or scarcely mucronate, style 2 fid ripe utricle brown ellipsoid much flattened pilose (in Indian examples) striate, beak linear, exsert portion of stigmas about as long as utricle *Schk Riedgr* ii 16 t Xx fig 111 *Kunth Enum* ii 392, *Boeck in Linnæa* xxxix 115 C gracilis, *Br Prodr* 242, *Boott Carex*, i 59, tt 154 155 156 [excl syn C lachnosperma, *Wall*] *Thw Enum* 355 C flexilis *Don Prodr* 42, not of Rudge C lenta *Don in Trans Linn Soc* xiv 327 *Kunth l c* 418 C nepalensis, *C B Clarke in Journ Linn Soc* xxv 82, not of Spreng

nt MUNEYPOOR, alt. 3750 ft, *C B* PULNEY and NILGHIRI HILLS, alt *Thwaites* —DISTRIB The Mascarene

Rhizome oblique *Stems* 1–3 ft slender *Leaves* ¾ stem, ⅛ in broad ... *sheaths* somewhat distant several from each sheath, ... 3–10 spikes *Spikes* 1¼ 2 ... brown Fem *glumes* oval ... rather small, not parallel-sided 9 15 nerved on each face, minutely hairy on nerves, suddenly narrowed into a beak about ⅓ utricle, beak shortly bifid, lobes erect *Nut* much flattened, ovoid, suddenly narrowed at top yellow brown, nearly filling utricle except beak *Style* about as long as beak, slightly swollen, contracted at base; branches long very brown, but much shorter than in the two following species — Limits and geographic range uncertain In many of the non Indian examples the utricles are glabrous, or there are several peduncles even from the middle sheaths of the inflorescence

13 **C. teinogyna,** *Boott Carex*, i 60, t 158 infl long lax, peduncles often 2 or more from one sheath bearing 1 or few spikes, fem glumes acute often mucronate, ripe utricle brown oblong much flattened striate, beak linear long deeply bifid, style 2 fid branches longer than utricle *Boeck in Linnæa*, xxxix. 115

ower leaves ak nearly as se on all the o very rarely of *style* 2,

14 **C. longicruris,** *Nees in Wight Contrib* 124, infl long lax, peduncles often 2 or more from one sheath bearing 1 or few spikes, fem

of style branches fully as long as utricle *Kunth Enum* ii 417, *Boott Carex*, i 59, t. 157, *Boeck in Linnæa*, xxxix 118. C longipes, *Thw. Enum* 355

W HIMALAYA from Kishtwar, alt 4000 ft, *C B Clarke*, to Nepal, *Wallich*. NILGHIRIS, *Perrottet*, *Wight*, alt. 8000 ft, *C B Clarke* CEYLON, *Thwaites* (C P 2749)

Very similar to *C longipes*, *brunnea*, and *teinogyna*, but distinct by the utricle *Utricle* long, triangular acuminate, the strictly linear portion of beak short, plane face 7-9-nerved, convex face 15 nerved bright ferruginous yellow with two scabrous green margins, margins in lower half of beak incurved over the plane face Fem *glumes* shorter than utricle Branches of *style* 2, nearly as long as in *C. teinogyna*

Sect 2 REMOTÆ Terminal spike male at base fem at top (or rarely fem in the middle male at both ends or accidentally wholly male), the other spikes male at base or the lower often wholly fem

* Spikes short, sessile or nearly so, ovoid or oblong, dense Glumes pale

15 **C. remota,** *Linn Sp Pl* 1383, infl. elongate lower spikes distant lowest bract long usually overtopping infl style 2 branched, utricle ellipsoid flattened narrowed into an oblong beak slenderly many-nerved on both faces *Schk Riedgr* i 46, & ii 22 t E, fig 23, *Nees in Wight Contrib* 121, *Kunth Enum* ii 404, *Reichb Ic Fl Germ* viii 8, t 212, figs 556, 557, *Boott Carex*, iv 198, & *Ic Ined* 669, 670, *Boeck in Linnæa* xxxix p 129 C axillaris, *Linn Sp Pl* 1382 Vignea remota, *Reichb Fl Germ Excurs* p 58

N TEMPERATE HEMISPHERE

Glabrous *Rhizome* short, slender without stolons *Stems* clustered, 1-2½ ft, slender *Leaves* ⅔ stem scarcely ⅛ in broad weak *Infl* often half length of plant, lower spikes solitary 1-3 in apart, lowest bract 4 10 in, very narrow, weak *Spike* ⅙-¼ in, ellipsoid, greenish *Glumes* ovate, acute keel green, sides pale *Anthers* linear, muticous *Utricle* small, glabrous scabrous on margin, beak 2-fid, lobes erect, margins scabrous *Nut* subovoid, flattened, ⅔ utricle excluding beak.

Var *β Rochebruni* (sp) Franch et Savat Pl Japon ii pp 126, 555, utricles nerveless on plane face, very slenderly 3-5-nerved on convex face, gradually narrowed upwards into a narrow-triangular beak —Temperate Himalaya, from Kashmir, alt. 7 8000 ft, to Sikkim, alt 7-12 000 ft, &c, and KHASIA HILLS, alt. 4500 ft — Beak of utricle is, in all Indian material, more or less winged, in this (as in the nerveless plane face) showing an approximation to 17 *C alta* In general appearance, it matches well typical European *C remota*

16 **C. canescens,** *Linn Sp Pl* 1383, infl linear, spikes short cylindric approximate, bracts short lowest much shorter than infl, style 2-branched, utricle ovoid flattened narrowed into a short triangular beak slenderly 8-10 nerved on both faces *Reichb Ic Fl Germ* viii 7, t. 206, figs 546, 547, *Boott Carex*, iv 154, t 496, *Boeck in Linnæa* xxxix 122 C curta, *Gooden in Trans Linn Soc* ii [1794] 145, *Schk Riedgr* i 43, & ii 21 t C, fig 13, *Kunth Enum* ii 403 Vigna canescens, *Reichb Fl Germ Excurs* 58

KASHMIR, alt 6-12,000 ft, *C B Clarke* —DISTRIB. Cooler parts of globe.

Glabrous *Rhizome* short slender, without stolons *Stems* clustered, 2 ft *Leaves* ⅔ stem, ₀ ₅ in broad *Infl* 2 5 in lower spikes solitary, 1 in apart; lowest bract setaceous about 1 in long *Spikes* ⅓ ½ in greenish *Utricle* small, glabrous, often nearly smooth on margin, beak triangular, hardly notched, minutely glandular scabrous

17 **C. alta,** *Boott in Proc Linn Soc* i 254 & *in Trans Linn Soc* xx 120 & *Carex* i 59, t 153, larger and stouter in all its parts than *C remota* beak of utricle strongly winged, so that utricle is widest in its upper half nut small not filling utricle (otherwise as *C remota*) *Boeck. in Linnæa*, xxxix 126 C Brizopyrum, *Kunze Suppl* 169, t 43

KHASIA, Mol m, alt 5800 ft, *C B Clarke* MUNEYPOOR, alt 5-6000 ft, *Wall.*—DISTRIB Java

br ad
cbrous
with a

18 **C. cooptanda,** *C B Clarke*, small, leaves linear, spikes 2 cylindric short dense close together, upper male at base pale brown, bracts hardly any, style 2 branched, utricle ovoid flattened narrowed into a short conical subentire beak nerveless smooth

KHASIA HILLS, *Griffith*

Glabrous *Rhizome* slender creeping d vided *Stems* C n sl ler F

Carex with the note of Boott on the n in Herb Hooker stating that they were collected by Griffith in Assam

** Spikes long-cylindric or linear, lower peduncled. Glumes coloured

19 **C. prælonga,** *C B Clarke*, tall, leaves long, spikes 4-9 linear nodding, styles 2 fid, utricle broadly ovoid compressed nerveless smooth suddenly narrowed into a very short linear subentire beak. C phacota, β minor, *C B Clarke in Journ Linn Soc* xxviii. 111

SIKKIM, alt 7 9000 ft, frequent, *C B Clarke*

Glabrous, tufted lower sheaths shining brown *Stems* 2 3 ft *Leaves* 18 by ⅙-⅕ in Lowest *spike* ⅓ 3 in distant

[illegible] *Utricle* ⅛ in, obovate turgid, yellow brown, whole surface minutely yellow glandular punctate, beak exactly linear, granular glandular, becoming very white when quite ripe, shortly notched; stigmas shortly exsert *Nut* obovoid, biconvex, very smooth, nearly filling utricle

Var β *angustior*, stems 12 18 in slender

[illegible] importance to the sex of the terminal spike

20 **C. teres,** *Boott Carex*, i 62 t 167 (excl lower utricle), tall, leaves long, spikes 4-9 linear nodding, styles 2 fid, utricle ellipsoid compressed

glumes lanceolate acute, style 2 fid ripe utricle ferrugin ovate lanceolate acuminate into beak glabrous except slightly notched with the green scabrous margins of style branches fully as long as utricle *Ku* *Carex*, i 59, t 157, *Boeck in Linnæa*, xxx *Enum* 355

overtopping in , asc, fem in middle and oblong lanceolate, aristate, ple, bristle green scabrous a face, whole surface minutely ar, hardly notched, stigmas very wed upwards.—This species, from the C *prælonga*, but rather stouter, the unlike

W HIMALAYA from Kishtwar alt 4000 f NILGHIRIS *Perrottet*, *Wight* alt 8000 ft, C 2749)

Very similar to *C longipes brunnea* *Utricle* long triangular acuminate th five 7–9 nerved convex face lo n brous green margins margins in Fem *glumes* shorter than utr *teinogyna*

Sect 2 REMOTÆ T the middle m dle at bot base or the l wer oft

* Spikes short

15 C. distant utricle nerve

12–13 000 ft., C B Clarke

distant, peduncle 2–3 in long, lowest bract overtopping spikes 2 by ¼ in, terminal usually fem at top clavate, the middle, sometimes wholly male Fem *glumes* as long as not or scarcely mucronate black purple back pale yellow.

—Not c from and much larger spikes

C. **cernua**, *Boott Carex*, iv 171, t 578, leaves long, spikes 4–8 very dense, styles 2 fid, utricle broadly ovate much compressed densely glandular subscabrous to base rich brown, beak conical entire

ASSAM, to Sudiya, *Jenkins*, *Simons*, *Griffith* (*Kew Distrib* 6099) —DISTRIB Tonkin, Japan

Stems 12 18 in *Leaves* as long as stem up to ½ in broad Lowest *spike* 2 in distant, peduncle ½–2 in long; bract overtopping infl., not sheathing *Spikes* up to 2½ by ½ in terminal one male at base (sometimes fem in middle male at both ends) Fem *glumes* as long as utricle, 3 nerved green on back bristle lanceolate excurrent rough *Utricle* scarcely ⅓ in stalked conical beak un distinguishable from utricle with no (or hardly any) linear termination —In *C prælonga* the whole utricle is sprinkled with minute yellow translucent glands sunk in the substance of utricle, in *C cernua* the glands are very thick, white, into depressed papilla *C cernua* appears really nearer *C phacota* than *C prælonga* but differs from both in the densely packed utricles

pale, slender, or shorter thicker purple-chestnut Fem *spikes* often 1 by ¼ in, *often* 2–7 fascicled with 1 or 2 remote below, frequently with 1–6 rectangularly
regular
, short,
Easily
[illegible] *ada*

31 **C.** [illegible]

pale ferrugino
on back, sid
purple with a
mouth of beak entire —The large [illegible] *ott in Proc* [illegible] *Soc* i 254, & *in Trans*
leaves hardly any absolute charact [illegible]
some, the bracts are slender, shorter t [illegible]
has a distinct linear prolongation nearly [illegible] from Gilgit, *Giles*, to
colour of the plant glumes and spikes [illegible]
examples have the spikes a rich brown [illegible] *Fem glumes* ovate-
characters for *C phacota* appear to be the [illegible] C *orbicularis*
glume with the utricle dense with glands [illegible] some European

24 **C. pruinosa,** *Boott in*
Soc xx 131, & *Carex*, i 65, t 174
utricle larger ⅛ in long, obscure
of which Boeckeler esteems it a f
EAST BENGAL, *Griffith* (*Kew Dis*
C B Clarke —DISTRIB Java
Boott (Carex, iv 198, Ic Ined 66
which has nerveless utricles

25 **C. Arnottiana,** *Nees*
current tip of glume smooth, utri
triangular with a minute linear
Boott Carex, iv 178, *Ic Ined* 607
Enum 356, *Boeck in Linnæa*,
Soc i 254, & *in Trans Linn Soc*
CEYLON, elevated parts of Central

26 **C. notha,** *Kunth Enum*
peduncles linear cylindric, fem g
styles 2 fid shorter than utricle,
3–5 nerved minutely glandular
beak *Boott Carex*, i 8, t 21, *Bo*
Nees in Wight Contrib 126 (style
C punctata, *Nees l c* 127 (*not of*
Royle Himal 412 C phacota, *Dr*
HIMALAYA, alt 5–11,000 ft, from
to Bhotan, *Griffith*.
Male *spikes* 2 in, brown Lowest

[illegible]
yellow or brown, [illegible]
Otherwise as *C phacota*.

nerved smooth gradually passing into a conical entire beak *Boeck in Linnæa*, xl 393

SIKKIM, alt 8-9000 ft, Sinchul, *J D H*; Tonglo and Sundukphoo, *C B Clarke*, &c

Glabrous, tufted, lower sheaths shining brown *Stems* 3 ft *Leaves* 18 by ¼ in Lowest *spike* ⅓-4 in, distant, peduncle 2-4 in long, bract overtopping infl, not sheathing *Spikes* 5 by ¼ in, terete, terminal male at base, fem in middle and usually at top Fem *glumes* as long as the utricles, oblong lanceolate, aristate, purp

h spikes 4-8 close together
red brown, utricle ellipsoid
nerveless minutely glandular
heterolepis, *Boott in Perry*

21 **C sikkimensis** 2-6 *C B Clarke*, tnon, *C B Clarke* MUNEYPOOR, 4-7 linear clavate, Japan, utricle ellip
nerved brown *rhizome* woody, into a co clustered, 1-2 ft *Leaves* numerous, as culm, scarcely ⅛ in *Spikes* 2 3 by ⅓-½ in, brown red,

SIKKIM, by long persistent styles, male spike paler, lowest spike rarely 1 in Lowest, lowest bract much overtopping inflorescence Fem *glumes* ovate triangular, the us ous or nearly so, rich brown with yellow keel *Utricle* very nearly as of *C. fucata* (or *C notha*), but exsert part of style branches much longer than utricle

C. P

NEPAL *Wallich* KHASIA HILLS, alt 4500 ft, Myrung and Nunklow, *J D H* —DISTRIB Japan

Glabrous *Stems* 1½-2½ ft *Leaves* nearly as long as stem up to ⅓ in broad

was *C heterolepis* Bunge, Enum Pl Chin Var [1831] 69 (*not of Boott*), for Bunge says h s *C heterolepis* resembled *C pendula*, but had a b fid style

30 **C. cæspititia**, *Nees in Wight Contrib* 127, spikes 4-10 lowest subsessile or erect on a short peduncle cylindric dense rigid, styles 2 fid, utricle ovoid compressed irregularly few nerved smooth eglandular suddenly narrowed into a minute entire beak *Kunth Enum* v 2, p 412, *Boott Carex* iv 133, t 428, fig 3, *Boeck in Linnæa*, xl 437—Carex, *Wall Cat* 3392

SYLHET, *Wallich* *C B Clarke*

Glabrous, 2 ft high habit of *C rigida* Gooden, but with a most irregular infl terminal male spike sometimes 4 in, usually 0-, in above the next, 2 in long,

pale, slender, or shorter thicker purple-chestnut Fem *spikes* often 1 by ¼ in, often 2-7 fascicled with 1 or 2 remote below, frequently with 1-6 rectangularly

31 **C. rigida,** *Gooden in Trans Linn Soc* ii 193, t 22, fig 10, stems 4-8 (rarely 10-12) in, leaves (dried) flat or margins near base slightly recurved, spikes 3 or 4 close together cylindric short dense, bracts not overtopping the infl., styles 2 fid, utricle ellipsoidal flattened smooth nearly nerveless apiculate by minute entire beak *Schk Riedgr* i 56 & ii 25, t U, fig 71, *Reichb Ic Fl Germ* viii 12, t 225, fig 578, *Boeck in Linnæa*, xl 114 C saxatilis, *Schk l c* 51, & ii 25, tt i, fig 40, & tt fig. 40, *Kunth Enum* ii 410 C vulgaris, *var* alpina, *Boott Carex*, iv 167, tt 568-574 C orbicularis, *Boott in Proc Linn Soc* i 264, & *in Trans Linn. Soc* xx [1851] 134

ALPINE HIMALAYA and W TIBET, alt 9-13,000 ft, from Gilgit, *Giles*, to Sikkim *J D H*—DISTRIB Cooler parts of the World

Stoloniferous *Leaves* often curved *Spikes* ½ ⅞ by ⅙-¼ in *Fem glumes* ovate-triangular, acute scarcely mucronate, chestnut purple—In the original *C orbicularis* Boott, the utricles are unusually large, but not larger than in some European forms.

32 **C. vulgaris,** *Fries Nov Mant* iii 153, & *Summ Veg* 230, stems often 10-20 in, leaves (dried) conduplicate, spikes less close longer, utricle more or less slenderly nerved, otherwise as *C rigida* *Reichb Ic Fl Germ* viii 13, tt 226, 227, *Boott Carex*, iv 166, tt 557 567, *Boeck in Linnæa*, xl. 416 C cæspitosa, *Schk Riedgr* i 57, & ii 27, figs A a, t 85, a, b, & B b, t 85, c, d, e, *Kunth Enum* ii 411.

N W HIMALAYA and W TIBET, alt. 10-13 000 ft, from Gilgit, *Giles*, to Lahoul, *Jaeschke*, frequent—DISTRIB Cooler parts of the World

Some of the material Mr Baker considers good Yorkshire *C vulgaris*, but there are many examples which he considers do not match either *C vulgaris*, Fries, or *C rigida*, Gooden

Var *β distracta*, spikes less close, lowest 2-7 in distant—Kashmir, Gurais, alt 8000 ft., *C B Clarke*—Altogether unlike any European form, *J G Baker*.

33 **C. erostrata,** *Boott ms*, utricles obovoid compressed beakless, otherwise as C rigida, *Strachey Cat Pl. Kumaon*, 73, *Duthie in T. E. Atkins Gazetteer*, x 618

KUMAON, Barji Kang Pass, alt 14,500 ft, *Strachey & Winterbottom* (*Carex*, n 22)

Instead of a minute beak there is a triangular notch at the top of the utricle. "I cannot recollect ever seeing any *C rigida* like it," *J G Baker*

Subgenus II CAREX *proper* Style branches 3 (see also 2 *C stenophylla*)

Sect. 4 BARBÆ Stem with 1 spike (see also 42 *C radicalis*), fem at base. Seta (i e rudiment of the suppressed upper part of spikelet) often present within utricle Bract hardly longer than fem glumes.

34. **C. microglochin,** *Wall in Handl Kong Vet Akad Stockh.* 140, & *Fl Lapp* 224, spike ⅓-½ in, style branches 3, utricles lanceolate acu-

minate glabrous striate ripe deflexed with seta protruded *Schk Riedgr* 32, t Ssss, fig 110, *Kunth Enum* ii 424, *Rchb Ic Fl Germ* viii 3 t 196, *Boott Carex* iv
Uncinia microglochin, *Spreng*
Soc xx 101 U europaea, *J*
Boeck Cyp Nov i 31 (*partly*)

N W HIMALAYA and W TIBET, alt 11–15,000 ft, *from the Karakorum, Thomson,* to Kunawur, *Jacquemont,* frequent —DISTRIB N Europe, Asia, Greenland

Glabrous *Rhizome* slender, very short *Stems* 6–12 in, slender *Leaves* scarcely ... a flower hardly $\frac{1}{10}$ in broad. ... r than utricle *Utricle* about ...) beak terete, mouth entire ... fruit the seta hardens into a ... h of the utricle, at its apex is ... rudimentary male fl —Uncinia differs from *Carex* only by the hooked end of the seta, but the hook is as much developed in *C microglochin* as it is in *U Kingii* and the only reason for not putting *C microglochin* into *Uncinia* is that the latter genus is very nearly confined to the S Hemisphere

35 **C. parva,** *Nees in Wight Contrib* 120, spike $\frac{1}{2}$–$\frac{3}{4}$ in, style-branches 3, utricles lanceolate acuminate long beaked glabrous striate, ripe deflexed with seta included *Kunth Enum* ii 419, *Boott Carex,* i 56, t 118 *Boeck in Linnaea,* xxxix 38 C macrorrhyncha, *Karel et Kiril in Bull Soc Mosc* iii [1842] 521

HIMALAYA alt 11–12 000 ft, from KASHMIR (Deosai), *Winterbottom,* to SIKKIM (Lachen), *J D H* —DISTRIB Central Asia

Resembles *C microglochin*, but stouter in all its parts *Spike* brown or chestnut *Fem glumes* ovate acute, lower aristate, lowest empty sometimes $\frac{1}{2}$ in (a bract) *Utricle* usually $\frac{1}{4}$ in and more (much like that of *C microglochin* reckoning in the seta), beak slender terete with oblique subentire mouth *Seta* sometimes carrying a rudimentary minutely hairy glume, but included

36 **C. linearis,** *Boott Carex* i 51, t 136, spike 2–3 in linear, style branches 3, utricle oblong complete glabrous nerveless beak linear conic as long as nut with a slit on posticous face extending $\frac{3}{4}$ length of beak *Boeck in Linnaea* xxxix 36 C Esenbeckii, *Boott in Proc Linn Soc* i 285, & *in Trans Linn Soc* xx 133 (*mainly not of Nees*) C elynoides, *J. Gay ms* Hemicarex sp *Benth in Gen Pl* iii 1072 H trinervis, *C B Clarke in Journ Linn Soc* xx 382, chiefly (*not Kobresia trinervis,* Boeck) Uncinia nepalensis, *Nees ms*

HIMALAYA, alt 11–14,000 ft., from KASHMIR, *Leringe,* to SIKKIM (Lachen), *J. D H*

Glabrous. *Rhizome* short, woody. *Stems* densely tufted, clothed at base with testaceous or subcastaneous sheaths becoming torn and fimbrillate, stems ultimately

in *C linearis* the beak of the utricle is split on the posticous face nearly (not quite) to its base, so that the nut is completely inclosed in the utricle The habit of *C. linearis* is entirely that of a *Kobresia*, and the two genera touch at this point

Var β *elachista*, stems (with nearly ripe fruits) scarcely 2 in, leaves exceeding stems spikes in fruit ⅛ in very slender all bisexual 2-4 nutted —W Nepal, alt 11-12 000 ft *Duthie* (n 6091) —This looks like a distinct species, but there is little of it and except in size no distinction between it and *C linearis* has been discovered

... inches 3, utricle ... beak as long as

SIKKIM, Lachen, alt 13 000 ft, *J D H*
Glabrous *Stems* 6 in., rigid, clustered, at base covered by dark chestnut shining fimbrillate sheaths. *Leaves* nearly as long as stems, setaceous *Spikes* seen wholly fem, about ⅛ in broad, denser, more rigid, than in *C linearis* Fem *glumes* ovate, obtuse brown, yellow-backed lowest hardly aristate *Utricle* with beak ⅛-⅙ in long, utricle proper obovoid, scarcely longer then the obovoid, nut passing imperceptibly into an ovoid compressed beak of same length and width, scabrous on margins, tip obtuse —A strange plant marked by Boott "dioica, the 4 spikes seen have some sterile glumes at top

38 **C. rara,** *Boott in Proc Linn Soc* i 284, & *in Trans Linn Soc* xx 139, & *Carex*, i 14, t 109, rhizome very short slender, stems and leaves very slender, spike ½-¾ by ⅛-⅙ in dense, style 3 branched, utricle ovoid-pyramidal many ribbed glabrous *Thw Enum* 354, *Boeck in Linnaea*, xxxix 36 C nana, *Boott in Mem Amer Acad N S* vi 418 & *Carex*, iv 139, t 449, fig 2 C capillacea, *Benth Fl Austral* vii 438 (*scarcely of Boott*)

Fem *glumes* ovate, obtuse, 3 nerved, shorter than utricles *Utricle* in fruit close, spreading at right angles, with no linear tip to beak or a most minute subrecurved mucro, strongly closely ribbed without glands, or in Khasi examples sometimes with fewer weaker ribs and scattered large glands between (= the Japan *C. nana*, Boott).

... i 44, t 110, rhizome 0, stems and ... ense, style 3 branched, utricle ovoid-... eck in *Linnaea*, xxxix. 37.

SIKKIM, alt 9-12,000 ft., *J. D. Hooker*, &c BHOTAN, *Griffith* —DISTRIB. Japan
Stems 4-10 in., tufted —Smaller in all its parts than *C rara*, but I see no other difference —The Australian plant called by Bentham *C capillacea* has leaves and spikes as wide as *C rara*, and I refer it to *rara* accordingly, it might be all treated as one

Sect. 5 INDICÆ Terminal spike fem at base male at top, or, when spikes very numerous many male at top, terminal (1 or few) sometimes wholly male.

* Subscapose, basal leaves long, cauline leaves and bracts very short.

40 **C cyrtostachys,** *Brongn in Bot Voy Coquille* 152, t. 25, infl compound, spikes linear oblong lax pale, style 3 fid, utricle ellipsoid trigonous many nerved minutely hairy, beak scarcely ¼ utricle *Kunth Enum* ii 513, *Moritzi Verz Zoll Pfl* 98, *Boott Carex*, ii 103, t 310, *Boeck in Linnæa*, xl 327 —Carex, *Wall Cat* 3383

PENANG; *Wallich* PERAK, alt 3500 ft *King's Collector*, SINGAPORE, *Ridley* —DISTRIB Malaya, China

Glabrous, except utricle *Rhizome* horizontal, thick *Leaves* many, subradical, 1 2 ft by ⅓-½ in, flat, tough, many nerved *Scapes* numerous, 4-9 in, with sheaths and peduncles nearly throughout their length, bracts 0-½ in, linear, peduncles exsert 0 1 in, 1-5 spiked *Spikes* ¾ by ⅙ ¼ in *Fem glumes* ovate, acute, scarcely mucronate, shorter than utricle *Utricle* ⅛ in, beak scarcely notched *Style* with its 3 branches short, style base linear *Nut* 'distorted by depressions' *Boott*, gynophore small yellow, there are two main lateral excavated patches (The only Indian species that has a strongly excavated distorted nut)

41 **C. [illegible]**
in broad,
cylindric [illegible]
trous beak linear ⅔ utricle

TENASSERIM, *Helfer* (*Kew Distrib* 6111 2)

Rhizome stout. *Leaves* 20 in, flat, sub 3 nerved *Scape* 10-14 in, bracts 2-3 by ¼ in, sublanceolate, peduncles exsert, 4 1 in, minutely hairy *Spikes* ¼ ⅓ in, oblong or (fruiting) ovoid, 4-1 nutted, ferruginous *Fem glumes* ovate, bristle exceeding beak of utricle *Utricle* [illegible] in and upwards, pyramidal at both ends, slenderly many nerved, minutely hairy, beak slender, mouth very small, base minutely bulbous to hold slightly bulbous style ba e —An unmistakable species

42 **C (?) pandanophylla,** *C B Clarke*, leaves long broad spikes in numerous fascicles on branches of scape female at base male at top, glumes elliptic obtuse minutely scabrous hairy long cuspidate Scleria pandanophylla *Kurz ms*

PEGU, Yomah *Kurz*

Very stout *Rhizome* oblique, woody *Leaves* subradical many, 1-2 ft by 1-1½ [illegible] se *Scape* [illegible] teoles ¾ in [illegible] th narrow [illegible] advanced, [illegible], but they might represent the youngest stage of a Mapanioid inflorescence, the leaves are altogether like those of *Mapania*

** Spikes short, very numerous (not scapose)

43 **C. [illegible]** long, infl elongate, o[illegible] s young spikes ¼-⅓ in [illegible] 3 fid, utricle sub[illegible] contracted into an [illegible] *Boeck in Linnæa*, Moritzi, *Steud in* [illegible] C longiaristata, *Boott ms*, *Kurz in Journ Asiat Soc Beng* xlv (pars 2), 160 C fissilis, *Boott ms*

EASTERN PENINSULA, from SIKKIM TERAI (Dulkajhar) *C B Clarke*, & CACHAR,

Thomson, to SELANGOR, *Kunstler* NICOBARS, *Jelinek* —DISTRIB Cochinchina, Java.

Glabrous, except secondary panicle-branches. *Rhizome* coarse, woody, with harsh black bristles (remains of sheaths) *Stems* 2–2½ ft. *Leaves* numerous, 2–3 ft. by ⅓ in, coarse, margins scabrous, nerves very numerous strong, 2 lateral prominent on upper face *Infl* 18 in, lower peduncles often 6 in exsert, bracts usually as long as infl *Spikes* (young) $\frac{1}{16}$ in diam, distant, in fruit divaricate, pale brown with about 6 divaricate utricles *Utricle* fuscous green, obscurely inflated, 20–30 nerved, beak oblique, sometimes sparsely setose, ⅓–½ utricle, mouth small oblique scarcely bifid *Nut* ellipsoid, trigonous, style-base somewhat bulbous —This is usually recognized among this critical group by the linear pale spikes and the frequent conspicuous subulate ¼ in bracteoles at their base C divaricata, *Wall Cat* 3533 from Saluen River, very young, has been supposed to be C indica, but it wants the characteristic setaceous bracteoles

Var ? β *laetelrunnea*, spikes ⅓ in fine brown, male glumes scarcely aristate young brown, utricles ripe brown obliquely erect not divaricate, style-base on ripe nut not bulbous C Thwaitesi, *Boott ms* (*not Hance*) C. bengalensis, *Thw. Enum* 355 (*not Roxb*) C indica (*partly*), *Boeck in Linnæa*, xl 347, *Boott Carex*, t 251 —CEYLON, *Thwaites* (C P n 2628) ?MERGUI, *Griffith* (*Kew Distrib* nn 6135, 6137, but specimens too young for determination)

Var *Milnei* (sp) *Boott ms*, slenderer with narrower leaves, spikes ⅓–⅛ in male part short glumes pale strongly aristate Carex? *Wall Cat* 3533 —Pahang, *Ridley* (n 2143, a) Borneo, New Caledonia, Polynesia —Stems 1 foot, leaves ¼ in. broad, bracteoles setaceous, less prominent than in C indica type

44 **C. distracta,** *C B Clarke*, leaves sub basal very long, infl elongate of distant peduncled pyramidal thin panicles, spikes ⅓–⅛ in linear-oblong solitary brown slenderly bracteate, fem glumes truncate aristate, style 3-fid C fissilis *Boott ms* (not *Boott Carex*)

ASSAM, *Herb Kew*

Habit and infl of *C indica*, Linn Partial panicles compound but lax, spikes mostly ⅓ in apart, early divaricate, bracteoles hair-like, ¼ in, inconspicuous *Utricle* (young) nearly glabrous —The closest affinity of this plant may not be with C indica, but it is exceedingly unlike Boott's C *fissilis* from Aneiteum, of which the type figured is in Herb Boott

45 **C.** [illegible]
not of N[illegible]
pyramidal [illegible]
nutted, sty[illegible]
contracted [illegible]
Boott Carex, n 85 partim (t 243), *C. B. Clarke in Journ Linn Soc.* xxv 82 C valida, *Nees in Wight Contrib* 123, *Kunth Enum* n. 513 C. indica, *Munro in Seem Bot Voy Herald* 423, *C B. Clarke l c.* xv. 119, *in Obs* (*not of Linn*) C. vacua, *Boott ms*, *Boeck in Linnæa*, xl. 343 (*partly*) C. Bruceana, *Boott ms* [*cf Boott Carex*, n 85] C. condensata, *Boott ms* (*Griffith*, *Kew distrib* n. 6049, &c) C. canaliculata, *Boott ms.*—Carex, *Wall Cat* 3100 B

[illegible] *Griffith*. [illegible] 3–600 ft; [illegible] *Rhizome* woody, horizontal. *Stem* 2–3 ft., stout. *Leaves* often as long as stem, ⅓–½ in. broad, flat, many-striate, caudate acuminate, 2 lateral nerves often manifest; basal sheaths usually shining yellow-brown, rarely much fimbriate into black tough

fibres *Infl* 12–20 in., lower peduncles often 2–3 in exsert, bracts usually as long as infl, leaf like *Spikes* in fruit divaricate on the stiff divaricate panicle-branches. *Glumes* (from middle female flowers) much shorter than utricle, ovate, minutely or not mucronate, 3–1-nerved on back ferruginous, lineolately marked *Utricle* $\frac{1}{10}$ in, ferruginous or brown, prominent in fruiting panicle, scarcely inflated, rarely glandular dotted, quite smooth or minutely scabrous towards neck; ribs about 12, thick, beak usually sparsely scabrous, with elliptic mouth on one side *Nut* fitting pretty closely utricle, ellipsoid, substipitate, pyramidal at top; style base scarcely dilated

Var *β nagporensis*, secondary panicles with suberect branches scarcely pyramidal sometimes very slender, ripe utricle scarcely inflated fuscous green often with black or red dots in upper half, beak subconic at base ½–⅓ utricle —Chota Nagpore, alt 2–4000 ft, common from the Kolhan to the summit of PARASNATH —A great variety of forms is here included, all undoubtedly one species and no one matching *C cruciata*, Wahl typ One form is large, with the secondary panicles long peduncled large dense branches in fruit very stout rigid erect, another has very narrow leaves, panicles slender the lower with only 5–8 spikes There is every gradation between The utricles are sometimes nearly glabrous, sometimes intensely scabrous with large linear conic points

Var *γ argocarpus*, secondary panicles pyramidal often very dense, ripe utricle glistening white inflated conspicuous C bengalensis, *Boott Carex*, ii 85 (*chiefly*) tt 240–242 *Boeck in Linnæa*, xl 346 (*partly*) C vacua and C condensata, *Boott ms* (*partly*)—Abundant in INDIA, from the E Nepal *J D H*, to Khasia and Assam, Tonkin —A plant collected by Boott on the Brahmapootra bank, having fuscous green utricles much less conspicuously ribbed, is supposed a plains form of var *argocarpus* Most of the glistening white fruits are fuscous in the herbarium

46 **C. parvigluma**, *C B Clarke*, leaves very long, stem short, infl usually of one pyramidal compound panicle, spikes as of *C cruciata*, style 3 fid, utricle globose trigonous many striate glabrous suddenly narrowed into a linear beak ¾ utricle

ASSAM, Luckimpore, alt 1500 ft, *C B Clarke*

Glabrous, except panicle branches *Rhizome* horizontal, woody. *Leaves* 2–3 ft. by ⅓ in *Stem* including infl 5 8 in *Infl* 3 by 1½ in, resembling much a single peduncl[illegible]
is added *Ke*[illegible]
rather larger,
allied, but diff[illegible]

47 **C. condensata**, *Nees in Wight Contrib* 123 (Royle, n 83 *only, not of Kunth*), leaves very long, infl elongate of distant peduncled oblong panicles, spikes ⅙–⅕ in clustered ferruginous 3–6 nutted, style 3 fid, utricle narrow ellipsoid [illegible] [illegible]eak ¼ length of utricle 2 fid. [illegible] *T. Atkinson Gaz* x. 616 C [illegible] (*chiefly*) C. indica, *var* cond[illegible] [illegible]dica, *Nees in Wight Contrib* p 123 (*Royle* n 85)—Carex, *Wall Cat* 3400 A

SIND, Pinwell. HIMALAYA, alt 1–10,000 ft, common, from Dalhousie to Bhotan KHASIA HILLS, alt. 4 5000 ft, abundant

[illegible] [illegible]d the nearly The (when

48 **C vesiculosa,** *Boott Carex* iii 107 t 323, infl irregularly panicled, spikes rarely clustered style 3-fid, utricle small narrow ellipsoid trigonous irregularly ribbed not inflated beak ½ utricle with narrow bifid mouth (otherwise as *C condensata*) *Boeck in Linnæa* xl 345 C diffusa *Boott ms* —Carex, *Wall Cat* 3400 β

SIKKIM HIMALAYA, alt 4000 ft, *C B Clarke* BHOTAN, *Griffith* KHASIA HILLS, alt 4–6000 ft, very common

Var β *paniculata* inflorescence a compound loose rich brown panicle, utricle $\frac{1}{15}$ in (larger than in *C vesiculosa*, Boott type) —Sikkim, alt 700–2500 ft (*Herb Griffith*), *C B Clarke*

49 **C. continua,** *C B Clarke*, leaves sub-basal very long narrow, infl. elongate cylindric nearly continuous spikes numerous solitary fine brown fem glume with bristle as long as utricle, style 3 fid, utricle small oblong ellipsoid trigonous strongly many nerved hairy narrowed into short deeply bifid beak *C Bruceana, Boott ms (in small part)*

NEPAL, *Wallich* SIKKIM HIMALAYA, alt 500 1100 ft, plentiful, *C B Clarke*

Tufted *Rhizome* woody, short *Stems* 8 16 in *Leaves* numerous much overtopping ster ... at base, bract ... ed, numerous ... in, narrow, bro ... ike that of *C* ... of *C cruciata*,

50 **C stramentitia,** *Boott ms*, *Boeck in Linnæa*, xl 351, infl young pale straw colrd ripe dirty straw colrd not brown, style 3 fid, utricle rather large globose trigonous many striate glabrous not inflated, beak linear ¼ utricle very shortly 2 fid C condensata *Boott ms (partly)* C condensata, β flava, *Nees in Wight Contrib* 123 C Wightiana, *Boott ms (partly)* C filicina, *Boeck ms in Herb Schlagintweit* n 11702 —Carex, *Wall Cat* 3398

From NEPAL to extreme E ASSAM alt 500 3000 ft, common in lower SIKKIM, *J D H* &c GARO, KHASIA and MIKIR HILLS on Assam face. CHOTA NAGPORE, BEHAR, on Parasnath alt 4000 ft, *C B Clarke*

... *Leaves* ... partial ... *conden* ... ery and ... ts l ab t, ... entirely separates it It is really very near *C indica*, Linn and closely resembles it in the utricle, *but the spikelets are shorter, whiter, and the characteristic conspicuous setaceous bracteoles of C indica are wanting*

51 **C. filicina,** *Nees in Wight Contrib* 123, leaves very long, infl. elongate of distant pyramidal compound panicles, spikes small often very many on slender branches not congested, female glumes small not (or scarcely) mucronate, style 3 fid, utricle small narrow ellipsoid or

linear beak ½ utricle —Boott never named this, but left it in his *C filicina* packet. Munro notes that it looks like *C Lindleyana*

57 **C. Wightiana,** *Nees in Wight Contrib* 122, leaves subbasal very long infl elongate, lower panicles distant peduncled oblong often simply spicate, spikes ⅓ in often 6–8 nutted pale suberect in fruit, bracteoles inconspicuous, style 3 fid, utricle ellipsoid trigonous many nerved greenish scabrous hairy, beak linear ¾ utricle *Kunth Enum* ii. 512, *Boott Carex*, i 11, t 30 (*excl Khasia plant*), *Boeck in Linnæa* xl 366 *Madras material Wight*, n 1915, &c) t n 1914, and in *Wight Contrib* 123 —

SOUTH MADRAS, Courtallum, *Wight*

Glabrous, except panicle branches and utricles. *Rhizome* stout horizontal. *Stems* 2–2½ ft. *Leaves* often as long as stem ⅓ ½ in broad *Infl.* often 12 by 3 in ,

three names

58 **C. ecostata,** *C B Clarke*, leaves narrow infl elongate dark brown lowest panicle distant slenderly peduncled narrow oblong (nearly reduced to a spike), fem glumes ovate triangular not mucronate, style 3 fid, utricle ellipsoid trigonous nearly nerveless glabrous, beak slightly oblique ⅔ utricle

EAST ASSAM, Jakpho Summit, alt. 9900 ft. *C B Clarke*

Closely resembles in general appearance and infl the Indian *C Wightiana*, but the utricles are almost nerveless, they usually have one face quite nerveless, the other faces with 1 or 2 irregularly placed thin nerves on each.

59 **C repan**

spikelets ¼–⅓ in

spicuous, utricle

curved ⅓–½ utricle (otherwise as *C Wightiana*) C Wightiana, *Boott Carex*, i 11 (var perigyniis glabris, *Boott*, ms i e the Khasian plant).

KHASIA HILLS, alt 3000 5500 ft., *J D H*, *C B Clarke*

60. **C perakensis,** *C B Clarke*, leaves subbasal long narrow, infl elongate, partial panicles linear oblong erect, spikes oblong 1–4 nutted white style 3 fid, utricle ellipsoid trigonous many-nerved hairy, beak straight linear about ½ utricle

PERAK, *Wray*

Glabrous (panicle branches minutely scabrous scarcely hairy) *Rhizome* stout, woody *Stem* 2 ft *Leaves* rather longer than stem, ½ in broad tough, sub 3-nerved. *Infl* 8 by 1½ in , lowest peduncle 3 in distant, bracts far overtopping inflorescence. Partial *panicles* with erect connivent branches in fruit, the dark-red styles prominent over the white glumes and white green utricles *Fem glumes* as long as utricle, exclusive of short bristle. *Utricle* (with beak) nearly ⅛ in , beak shortly bifid.

61 **C sanguinea,** *Boott in Proc Linn Soc* i. 285, & *Trans Linn Soc* xx 137, & *Carex*, ix 157, t 515, leaves shorter than infl narrow, infl elongate, partial panicles oblong with irregularly capitate dark red spikes, style 3 fid, utricle narrow ellipsoid trigonous narrowed at

both ends minutely scabrous hairy, beak scarcely ½ utricle *Boeck in Linnæa*, xl 374, *Boiss Fl Orient* v 406

W HIMALAYA, alt 3000-6000 ft, Kunaor, *Royle*, Hazara, *Stewart*, Murree, *Fleming*, *Trotter*

Glabrous (panicle branches minutely scabrous hardly hairy) *Rhizome* woody, branched, with several approximate stems *Stems* including infl 8 18 in *Leaves* numerous, scarcely ¼ in broad *Infl* often occupying ⅔ the plant, lower peduncles exsert, bracts finely caudate, shorter or longer than inflorescence *Spikes* ⅙-⅓ in, 4-8 nutted, comose from the long red style-branches *Fem glumes* ovate triangular,

Indian *C Lindleyana*, &c, it should perhaps stand next *C vesiculosa*, Boott.

62 **C. rhizomatosa,** *Steud in Zoll Verz Ind Archip* ii (1851), 60 and *Syn Cyp* 206, leaves shorter than infl narrow, infl linear, peduncles distant slender nearly simple, spikes ovoid 1-4 nutted brown in irregular heads, style 3 fid utricle broadly ellipsoid trigonous scabrous hairy, beak scarcely ½ utricle 2 fid *Miq Fl Ind Bat* iii 348 C Cumingiana, *Steud Syn Cyp* 206 *Boott Carex* iii 107, tt 324 325, *Boeck in Linnæa*, xl 367, *Vidal Pl Vasc Filip* 286 C capitulata, *Boott ms*

ASSAM, Gowhatty, *Boott* KHASIA HILLS, N face alt 2-3000 ft, frequent, *C B Clarke* MUNEYPOOR, *Watt* PATKOYE MTS, *Griffith*—DISTRIB Tonkin, Java Philippines

Glabrous (except utricles) *Rhizome* very tough, covered with black fibres of torn sheaths (it grows where the grass is burnt annually) *Stems* tufted, 6-18 in *Leaves* usually 3-6 in by ⅛ in not caudate *Infl* 6-10 by scarcely ⅛ in, upper bracts about as long as infl *Heads of spikes* 1-⅓ in diam, usually only one on each peduncle, but peduncles often 2 from one sheath *Fem glume* ovate lanceolate, brown often mucronate, male glumes mucronate *Utricle* fuscous brown, obscurely 8-15 nerved

63 **C. Lindleyana,** *Nees in Wight Contrib* 121, leaves subbasal long narrow, infl elongate lower peduncles distant, partial panicles condensed oblong brown green, style 3 fid, utricles oblong ellipsoid many-nerved glabrous, beak linear straight deeply bifid ⅔ utricle *Kunth Enum* ii 512, *Boeck in Linnæa* xl 362 C thyrsiflora, *Boott Carex*, i 12, t 34 C cruciata, *Thw Enum* 355 (*partly*)

NILGHIRI HILLS, alt 6-8000 ft, *Wight*, frequent CEYLON, alt 5-8000 ft, *Thw* (C P 3161, &c)

Stems 1-2½ ft *Leaves* ¼ in broad, not overtopping infl, not caudate *Fem glumes* ovate, sometimes shortly mucronate, many nerved *Utricles* not much differing from those of *C cruciata*, Wahl, with which Thwaites united it Partial panicles 1½ by ½ in, dense, unlike the pale pyramidal partial panicles of *C cruciata*

64 **C. leucantha,** *Arnott ex Boott in Proc Linn Soc* i 257, and *in Trans Linn Soc* xx 135, and *Carex*, i. 10, t 23, leaves very long narrow, infl elongate depauperated, peduncles few distant very short carrying 1 or 2 small whitish heads style 3 fid, utricles broad ellipsoid trigonous many nerved hairy not inflated, beak linear ⅔ utricle *Thw Enum* 355, *Boeck in Linnæa*, xl 369

SOUTH DECCAN, Courtallum, *Wight* CEYLON, not rare up to 2000 ft, *Thwaites* (C P 2631, &c)

Stems 1 2 ft, rather slender *Leaves* overtopping infl., ¼ in. broad *Lower*

peduncles often 6–8 in distant, exsert 1–2 in, *heads depauperated*, ½ *in* diam of 1–6 spikes *Spikes* ½ in, ovoid (in fruit), 4–8 nutted *Fem glumes* ovate, acuminate, cuspidate (cusp not overtopping beak of utricle), nearly glabrous except at top. *Utricle* (with beak) ⅕ in, nerves 20 not strong, beak rather deeply bifid, very little conic dilated at base.

65 **C. malaccensis,** *C B Clarke*, heads pyramidal rigid ¾ in diam white, female glumes minutely hairy, utricle strongly nerved glabrous subinflated narrowed into conico linear flattened beak scabrous on margins, otherwise as *C leucantha*

·· .

horizontally spreading (in *C* *cle* curved inwards trigonous *C leucantha* nearly terete) te white heads are very like

—··· ···· ··
C leucantha

66 **C. spicigera,** *N*
narrow, infl oblong pan
partial panicles oblong in
many-nerved hairy, beak
Boott Carex, i. 10, t 29,

CEYLON, "Central Province up to 6000 ft," *Thwaites* (C P n 822), &c
Stems 1–1⅓ ft. *Leaves* overtopping infl, ⅛–⅙ in broad *Infl* 3 by 1 in, partial panicles ½ by ¼ in dense *Spikes* in fruit ovoid, 4-nutted *Fem glumes* ovate often aristate, shorter (including bristle) than utricle *Utricle* $\frac{1}{10}$ in, brown-red, beak scarcely notched

Var β *minor* Thw l c 355, very slender, infl 1 by ⅕ in E Gardner, *Boott ms*—CEYLON (C P n 824) *Gardner* *Stems* 8–10 in, almost capillary *Leaves* scarcely ⅛ in. broad Inflorescence reduced to a subsessile interrupted spike

Var γ *rubella* (sp) Boott Carex iv 176, t 599, infl a single terminal pyramidal dense head ⅔ in diam —Ceylon (C P 2629)

Var ? δ *rostrata*, Boeck in Linnæa xl 369, utricles nearly twice as long narrower evidently beaked nearly smooth glumes muticous [Cf Thw Enum 355] —CEYLON, *Thw* (C P 2629) —This appears from description scarcely a var of *C spicigera*, but I have failed to find it among Thwaites C P 2629

*** Spikes long cylindric Peduncles mostly solitary, sometimes 2, in each sheath (cf *C arridens* n. 78) [Terminal spike sometimes wholly male in *C desponsa* and *C præstans*]

67 **C. baccans,** *Nees in Wight Contrib* 122, robust, leaves and bracts long, panicle oblong or linear oblong, fem glumes striate nearly throughout their width, style 3 fid, utricle ovoid trigonous gibbous finally berried beak short ultimately minute *Kunth Enum* ii 513, *Thw Enum*. 355, *Boott Carex* ii 83, tt. 234–236 and 238, 239, *Boeck in Linnæa*, xl 339, *C B Clarke in Journ Linn Soc* xxv 82 C curvirostris, *Kunze Suppl* 79, t 20, *Miq Fl Ind Bat* iii 350 C recurvirostris, *Steud in Zoll Verz Ind Archip* ii 60, and *Cyp* 207 C dolicophylla, *Link ms* (*fide Boeckeler*)

MALABAR GHATS
hilippines
approximate stems
broad *Infl* 12 18

, lowest peduncle
spikes 1½ by ¼ in,
, acute or obtuse,
often cuspidate sometimes (even in large examples) muticous *Utricle* in the fully developed state $\frac{1}{10}$ in diam, nearly globose, wall thickened more or less succulent, red, nearly glabrous rarely obscurely scabrous hairy near top, utricles in the half-ripe state usually olivaceous with more prominent recurved beak *Nut* ellipsoid-trigonous, pyramidal at both ends, black, much narrower than utricle, style-base linear

Var ? β *siccifructus* fem glumes 3-5 nerved close to the keel, ripe utricles ovoid somewhat inflated strongly many nerved pale scabrous hairy near top, beak straight short bifid C baccans (an var an sp nova ?) *Boott Carex*, t 237—Khasia, near Cherra, alt 3500 ft, *J D H, C B Clarke*—Appears nearer *C Myosurus* &c, than *C baccans*, the utricles get more or less red occasionally

68 **C. Myosurus,** *Nees in Wight Contrib* 122, robust, leaves and long many tailed by at both ends nerved raight *Kunth Enum* in *Linnæa*, xl 334 C macrophylla *Hochst ms ex Steud. Syn Cyp* p 207 C æquata, *Nees ms*—Carex, *Wall Cat* 3384 B

Nilghiri & Pulney Hills, alt 5-7000 ft, common Courtallum, *Wight*
Glabrous except utricles *Rhizome* stout, short *Stems* 2-3 ft *Leaves* often as long as stem
var β), bra
pale or more
muticous *U*
not strong
not d late

usually broader) in var β than in the Nilghiri plant, in *C eminens* Nees, the common Himal plant the beak is deeply bifid, in some Sikkim and Bhotan plants (*C floribunda*, Boeck) the beak is not more notched than in the Nilghiri plant (the utricle is much broader) In Wallich, n 3384, A, the whole of the upper part of the infl is male

Var γ *ratongensis*, panicle narrow 10-15-spiked, fem glumes muticous deep brown utricle very small oblong ellipsoid beak very short lightly notched—"C Myosurus ? *potius quam* C baccans," *Boott ms*—Upper Sikkim, alt. 6-8000 ft, Ratong Valley *J D H*—Is taken here as an extreme high level state of *C. Myosurus*, Nees (forma floribunda (sp) *Boeck*)

69 **C. præstans,** *C B Clarke*, tall, very long, lower peduncles very distant solitary long, spikes long many of the upper wholly male or with 1 or 2 fem only at base, fem glumes elliptic lanceolate scarcely mucronate pale overtopping utricles, style 3 fid, utricles ovoid trigonous minutely hairy at top, beak conic linear ⅓ the length of utricle. C Myosurus, *Duthie ms*

Kumaon, alt. 7-8000 ft, *Duthie* (n. 6118)
Glabrous *Stem* 3 ft. *Leaves and bracts* as in *C Myosurus* *Infl.* 2 ft. long;

peduncles often 6–8 in distant, exsert 1–2 in, heads depauperated, ½ in diam of 1–6 spikes *Spikes* ½ *in., ovoid* (*in fruit*), 4–8 *nutted* *Fem glumes* ovate, acuminate, cuspidate (cusp not overtopping beak of utricle), nearly glabrous except at top *Utricle* (with beak) ⅛ in, nerves 20 not strong, beak rather deeply bifid, very little conic dilated at base.

65 **C. malaccensis,** *C B Clarke*, heads pyramidal rigid ¾ in hairy, utricle strongly nerved co linear flattened beak scabrous

horizontally spreading (in *C* *cle* curved inwards trigonous *C leucantha* nearly terete) te white heads are very like *C leucantha*

66 **C. spicigera,** *Nees in Wight Contrib* 121 leaves very long narrow, infl oblong panicled fuscous lower peduncles 1–2 in distant, partial panicles oblong interrupted, style 3 fid utricle ellipsoid trigonous many nerved hairy, beak oblong scarcely ¼ utricle *Kunth Enum* ii 512, *Boott Carex*, i. 10, t 29, *Thw Enum* 355, *Boeck in Linnæa*, xl 368

CEYLON, "Central Province up to 6000 ft," *Thwaites* (C P n 822), &c

Stems 1–1½ ft *Leaves* overtopping infl, ⅙–⅛ in broad *Infl* 3 by 1 in, partial panicles ½ by ¼ in dense *Spikes* in fruit ovoid, 4-nutted *Fem glumes* ovate often aristate, shorter (including bristle) than utricle *Utricle* $\frac{1}{10}$ in, brown red, beak scarcely notched

Var β *minor* Thw l c 355 very slender, infl 1 by ½ in E Gardneri, *Boott ms* —CEYLON (C P n 824) *Gardner* *Stems* 8–10 in, almost capillary *Leaves* scarcely ⅛ in. broad Inflorescence reduced to a subsessile interrupted spike

Var γ *rubella* (sp) Boott Carex iv 176 t 599, infl a single terminal pyramidal dense head ¾ in diam —Ceylon (C P 2629)

Var ? δ *rostrata*, Boeck in Linnæa xl 369, utricles nearly twice as long narrower evidently beaked nearly smooth glumes mutious [Cf Thw Enum 355] —CEYLON, *Thw* (C P 2629) —This appears from description scarcely a var of *C spicigera*, but I have failed to find it among Thwaites C P 2629

*** Spikes long cylindric Peduncles mostly solitary sometimes 2, in each sheath (cf *C arridens* n 78) [Terminal spike sometimes wholly male in *C desponsa* and *C præstans*]

67 **C. ...** ist, leaves and s striate nearly gibbous finally 3, *Thw Enum* *in Linnæa* xl 339 *C B Clarke in Journ Linn Soc* xxv 82 C curvirostris *Kunth Suppl* 79, t 20, *Miq Fl Ind Bat* iii 350 C recurvirostris, *Steud in Zoll Verz Ind Archip* ii 60, and *Cyp* 207 C dolicophylla, *Link ms* (*fide Boeckeler*)

SIKKIM and KHASIA to the NAGA HILLS alt 2500–7000 ft. MALABAR GHATS to CEYLON, alt. 3–6000 ft —DISTRIB Java, Sumatra, China, Philippines

Glabrous *Rhizome* very stout, short, horizontal, with approximate stems *Stems* often 3 ft. *Leaves* often overtopping inflorescence, ½ in broad *Infl* 12 18

ripe state usually olivaceous with more prominent recurved beak. *Nut ellipsoid-trigonous*, pyramidal at both ends, black, much narrower than utricle, style-base linear

Var ? β *neerifructus*, fem glumes 3 5 nerved close to the keel, ripe utricles ovoid somewhat inflated strongly many nerved pale scabrous hairy near top, beak straight short bifid C baccans (an var an sp nova?) *Boott Carex*, t 237 — Khasia; near Cherra, alt 3500 ft, *J D H*, *C B Clarke* —Appears nearer *C Myosurus* &c, than *C baccans*, the utricles get more or less red occasionally

68 **C. Myosurus,** *Nees in Wight Contrib* 122 robust, leaves and many tailed by ... th ends nerved ... *Kunth Enum* ii 507, *Boott Carex*, ii 87, tt 229, 230, 232, *Boeck in Linnæa*, xl 334 C macrophylla *Hochst ms ex Steud. Syn Cyp* p 22 C æquata, *Nees ms* —Carex, *Wall Cat* 3384 B

NILGHIRI & PULNEY HILLS alt 5–7000 ft, common Courtallum, *Wight*

Glabrous except utricles. *Rhizome* stout, short *Stems* 2-3 ft *Leaves* often as long as stem, ¼–½ in broad, scabrous caudate *Panicle* 1 foot lax (see remarks under var β), branches scabrous, scarcely hairy *Spikes* 3 by ⅛ in, many male 1½ in, pale or more rarely deep brown. *Fem glumes* ovate, often cuspidate, sometimes muticous *Utricle* exceeds ⅛ in in Nilghiri type, pale, much stipitate; nerves 12-15, not strong *Nut* narrowly ellipsoid, trigonous, stipitate, filling utricle, style base not dilate

... r, beak ... 35 C ... l Cat ... nur to ... Clarke, ... deep- ... r (and ... the common

Himal. plant the beak is deeply bifid, in some Sikkim and Bhotan plants (*C floribunda*, Boeck) the beak is not more notched than in the Nilghiri plant (the utricle is much broader) In Wallich, n 3384, A, the whole of the upper part of the infl is male

Var γ *ratongensis*, panicle narrow 10–15 spiked, fem glumes muticous deep brown, utricle very small oblong ellipsoid, beak very short lightly notched —" C Myosurus ? *potius quam* C baccans," *Boott ms* —Upper Sikkim, alt. 6-8000 ft, Ratong Valley, *J D H* —Is taken here as an extreme high level state of *C Myosurus*, Nees (forma floribunda (sp) *Boeck*)

69 **C. præstans,** *C B Clarke*, tall, very long lower peduncles very distant solitary long, spi... male or with 1 or 2 fem only at ba... carcely mucronate pale overtopping ... trigonous minutely hairy at top, beak conic linear ⅓ the length of utricle C Myosurus, *Duthie ms*

KUMAON, alt. 7-8000 ft, *Duthie* (n. 6118)

Glabrous *Stem* 3 ft. *Leaves* and *bracts* as in *C Myosurus* *Infl* 2 ft, long,

peduncles often 6–8 in distant, exsert 1–2 in , heads depauperated, ½ in diam of 1–6 spikes *Spikes* ½ in , ovoid (in fruit), 4–8 nutted *Fem glumes* ovate, acuminate, cuspidate (cusp not overtopping beak of utricle), nearly glabrous except at top *Utricle* (with beak) ⅙ in , nerves 20 not strong, beak rather deeply bifid, very little conic dilated at base.

65 **C. malaccensis,** *C B Clarke*, heads pyramidal rigid ¾ in . . utely hairy, utricle strongly nerved conico linear flattened beak scabrous . *ia*

MALACCA Langkawi, *Ridley* (n 1669)

C leucantha

121, leaves very long luncles 1–2 in distant, ricle ellipsoid trigonous *Kunth Enum* ii 512, *in Linnæa, xl* 368

CEYLON, "Central Province up to 6000 ft," *Thwaites* (C P n 822), &c

Stems 1–1½ ft. *Leaves* overtopping infl, ⅙–¼ in broad *Infl* 3 by 1 in , partial panicles ½ by ¼ in dense *Spikes* in fruit ovoid 4-nutted *Fem glumes* ovate often aristate, shorter (including bristle) than utricle *Utricle* $\frac{1}{10}$ in , brown-red, beak scarcely notched

Var β *minor* Thw l c 355 very slender, infl 1 by ⅓ in E Gardneri, *Boott ms*—CEYLON (C P n 824) *Gardner* *Stems* 8–10 in , almost capillary *Leaves* scarcely ⅛ in. broad Inflorescence reduced to a subsessile interrupted spike

Var γ *rubella* (sp) Boott Carex iv 176, t 599, infl a single terminal pyramidal dense head ¾ in diam —Ceylon (C P 2629)

Var ? δ *rostrata*, Boeck in Linnæa xl 369, utricles nearly twice as long narrower evidently beaked nearly smooth glumes muticous [Cf Thw Enum 355] —CEYLON, *Thw* (C P 2620) —This appears from description scarcely a var of *C spicigera*, but I have failed to find it among Thwaites C P 2629.

*** Spikes long cylindric Peduncles mostly solitary sometimes 2, n each sheath (cf *C arridens* n 78) [Terminal spike sometimes wholly male in *C desponsa* and *C præstans*]

ist, leaves and s striate nearly

berried beak short ultimately minute 355, *Boott Carex* ii 83, tt 234–236 an 339, *C B Clarke in Journ Linn Soc Suppl* 79, t 20, *Miq Fl Ind Bat* iii *Zoll Verz Ind. Archip* ii 60, and *Cyp* 207 C dolicophylla, *Link ms* (*fide Boeckeler*)

alt 2500–7000 ft. MALABAR GHATS Sumatra, China, Philippines horizontal, with approximate stems inflorescence, ½ in. broad *Infl* 12 18

nut is obtuse at top —The difference in size, stoutness, and breadth of leaves between this and *C Daltoni* is great

81 **C. Winterbottomi,** *C B Clarke*, leaves and bracts narrow slightly overtopping infl, infl long narrow of 19 spikes whereof 6 terminal wholly male, peduncles clustered, fem glumes elliptic acute pale, style 3 fid, utricle ellipsoid trigonous nerveless hairy, beak bifid ¼ length of utricle *C setigera? var fasciculata, Strachey Cat Pl Kumaon*, 73, *Duthie in T E Atkinson Gaz* x 616

Kumaon, alt 8000 ft, *Strachey & Winterbottom* (n 16)

Glabrous *Rhizome* creeping, woody *Stems* approximate, 10 in *Leaves* $\frac{1}{8}$-$\frac{1}{6}$ in broad, rather rigid *Infl* 6 by 1 in, peduncles shortly exserted little divided Terminal 6 *spikes* male 1 by $\frac{1}{10}$ in, glumes pale brown, acute, not cuspidate, margins white shining Lower *spikes* $\frac{3}{4}$ by $\frac{1}{6}$-$\frac{1}{5}$ in, with 4–8 basal females. *Style-branches* 3, rather long *Fem glumes* pale, 1 nerved, exceeding utricles

82 **C. pulchra,** *Boott Carex*, i 4, t 13, leaves shorter than infl narrow, infl oblong, peduncles short clustered, spikes rather numerous linear, chestnut brown, fem glumes very small not cuspidate, style 3 fid, utricle small narrow ellipsoid trigonous nerveless glabrous red brown, beak conic linear $\frac{2}{3}$ length of utricle shortly bifid *Boeck in Linnæa*, xl 336

Sikkim Himalaya, alt 10–14,000 ft, Lachen, *J D H* East Nepal, Tambur River, *J D H*

Glabrous. *Stolons* slender *Stems* approximate 8–16 in, slender *Leaves* scarcely $\frac{1}{8}$ in broad, 1 or 2 cauline often present *Infl* 4 by 1 in, spikes mostly fem with a few males at top, terminal sometimes wholly male, peduncles often 6 or more clustered, not rarely divided *Spikes* 1 by $\frac{1}{16}$-$\frac{1}{12}$ in, much slenderer than in *C inæqualis* or *Daltoni* *Fem glumes* $\frac{1}{24}$ in, about as long as utricle —This species differs from all (except *C munda*, Boott) by the very small glumes and utricles, and very slender spikes

83 **C. munda,** *Boott Carex*, i 7, t 20, leaves about as long as infl narrow, infl very lax, peduncles distant long lower often paired, spikes oblong linear straw colrd, fem glumes elliptic triangular tipped, styles 3 fid, utricle ellipsoid trigonous nerveless glabrous green yellow, beak ¼ utricle nearly entire *Boeck in Linnæa*, xl 383

Sikkim Himalaya, alt. 10–14 000 ft, *J D H*, &c, frequent.

Glabrous *Stolons* slender *Stems* 10 18 in, very slender *Leaves* $\frac{1}{8}$-$\frac{1}{6}$ in. broad, weak *Infl* of few scattered distant solitary spikes, lower peduncles often exsert 3–6 in *Spikes* mostly fem at base (terminal sometimes wholly male), $\frac{3}{4}$ by $\frac{1}{8}$ in *Utricle* $\frac{1}{12}$-$\frac{1}{10}$ in.—Closely allied to *C pulchra*, Boott, spikes and utricles larger (though small) Rhacheola not rarely developed inside utricle Possibly a form of *C Stracheyi*, the utricles are rather smaller, glabrous, the terminal spike usually fem at base

C. [illegible] *Pl Kumaon*, 73, spikes [illegible], uppermost 2 male, lower [illegible] llipsoid lanceolate setulose narrowed into a linear conic beak *Duthie in T E Atkinson Ga*. x. 618.

N W Himalaya, Kumaon, alt 8000 ft. (Mudhari Pass), *Strachey & Winterbottom* (n 18) Gurwhal alt 12–13,000 ft, *Duthie*

Glabrous *Stems* 12–18 in *Leaves* as long as the stems ¼ in broad *Panicle* commencing at 8 in from base of stem *Peduncles* 2–5 from one sheath, 3–7 in,

exsert style branches much shorter than utricle Nut fitting the utricle, ellipsoid, trquetrous, brown —Very like *C munda*, Boott

***** Species of Sect "INDICÆ" not easily placed in any one of the preceding four subsections

85 **C. curvata,** *Boott Carex*, i 2, t 5 (non Knaf), small, leaves filiform, infl compound oblong yellow dense, spikes very small ovoid 4–6-nutted with few males at top, utricle ellipsoid plano-convex 3 nerved, glabrous beak very short oblong bifid, style 3 fid *Boeck in Linnæa*, xxxix 110

SIKKIM HIMALAYA, Tungu, alt 12–13,000 ft, *J D H* Pharee, *Dungboo*
Glabrous *Rhizome* woody *Stems* densely caespitose, 2–6 in, sometimes curved. *Leaves* overtopping the short stems, often curved, edges inrolled *Infl* 1¼ by ⅛ in, lowest bract often overtopping it Lowest *partial* panicle subsessile (peduncle included in the short sheath) nearly ½ in with 2–6 spikes *Spikes* ⅛ in, nearly entirely fem Fem *glumes* ovate, acute, scarcely mucronate, yellow, back green, ... , yellow with ... ito its teeth ... en, 3 striate, ... ig the utricle ... Boeckeler has ... *Kobresia*.

86 **C. inclinis,** *Boott ms*, stems 4–9 in slender 4–6 spiked, leaves much overtopping infl narrow, spikes solitary nearly all male at top terminal usually fem at base, style 3 fid, utricle narrow ellipsoid trigonous nearly nerveless, beak ⅓–½ length of utricle C setigera, *var* δ inclinis, *Boott ms*

SIKKIM HIMALAYA, Tonglo, alt 10 000 ft, and Lachen, alt 12–13,000 ft, *J D H*, &c
Glabrous, except minutely hairy utricles *Rhizome* creeping, stolons elongate, rather slender *Leaves* numerous, 1 ft (and upwards) by ... in —Out of 17 terminal *spikes* 2 are wholly male, 15 fem (usually only a few distant utricles) at base *Spikes* solitary ⅜ by ¼ in, male glumes dark red Fem *glumes* ovate lanceolate, mucronate, not quite reaching beak of utricle —Technically near *C composita*, Boott

87 **C. fragilis,** *Boott Carex*, i 7, t 21, stem very slender, leaves about as long as stem narrow, peduncles 3–6 very distant filiform, spikes male basal fem distant, style 3 fid, utricle (unripe) oblong obovoid minutely scabrous hairy, beak linear ½–⅓ utricle *Boeck in Linnæa*, xl 383

... ly uni ... Lowest ... with 10 ... Fem ... ly few- ... I, the
material of both being scanty, and the fruits of *C fragilis* only half ripe, it is not

safe to unite them C fragilis differs by the extreme slenderness of the infl and peduncles, and by lowest bract not (or scarcely) overtopping infl.

88 **C. munipoorensis,** *C B Clarke*, short leaves and bracts

MUNIPOOR, Jopoo, alt 9500 ft *Watt* (n 6894)

Glabrous. *Rhizome* woody *Stems* appr xim te 6–8 in *Leaves* subbasal, numerous up to 11 in by ⅙ in rather tough *Infl* 3 by 1 in, a solitary long-peduncled spike sometimes added near base of stem *Spikes* 12 14 on 1 stem, ⅜ by ⅛ in, dense Male *glumes* very elongate not cuspidate, fem glumes similar, rather less elongate, shining, irregularly 3 5 nerved *Utricle* not ripe

89 **C. speciosa,** *Kunth Enum* ii 504 leaves long spikes 3–1 very remote linear fem at base, style 3-fid fem glumes short ovate muticous, utricle ovoid pyramidal many striate green puberulous hardly beaked *Boott Carex* i 5_, *Boeck in Linnæa* xl 388 *C B Clarke in Journ Linn Soc* xxv 82 C concolor *Nees in Wight Contrib* 125 (*not R Br*) C peduncularis, *Wallich ms* C courtallensis *Nees ms*, *ex Boott Carex*, i 52, t. 138.

Widely distributed in INDIA alt 1 7000 ft, from Nepal to Sikk m, and Kh sia Hills to Muneypoor, also Rajmahl Parasnath, and Mts of S India—DISTRIB Borneo

Glabrous *Rhizome* woody, short with tough fibres (remains of lower sheaths) *Stems* 1–2 ft slender but tough *Leaves* (subbasal) often exceeding stem, some [illegible] wide tough m[illegible] striate sometimes ⅜ in broad, flat *Peduncles* [illegible] long [illegible] –3 in [illegible] tricles [illegible] trale,

90 **C. radicalis,** *Boott Carex* i 56 t 147, leaves subradical many exceeding the slender stems spikes 2–1 very remote broad ovoid ¼ in diam, style 3-branched, utricle ovoid many ribbed hairy *Boeck in Linnæa*, xxxix 10

[illegible] D H [illegible] *Leaves* 10 by $\frac{1}{10}$ in., many [illegible] h somet mes with a leaf and [illegible] of 2 or 3 obscurely fused into [illegible] ved, lower mucronate, lowest [illegible] linear beak, dull green

91 **C. curticeps,** *C B Clarke*, leaves as long as stem narrow, spikes 2–14 very long approximate several terminal often male or with few fem at base fem glumes ovate usually cuspidate, style 3-fid, utricle ⅛ in and upwards elongate lanceolate nerveless glabrous, beak ⅓ as long as utricle

SIKKIM HIMALAYA, alt 10–12 000 ft., common, *C B Clarke.*

Glabrous. *Stems* 1–2 ft *Leaves* rarely more than ⅙ in broad *Inf* 1 2½ in. long Fruiting *spikes* 2–3½ in long glumes ⅛ in apart ⅛ in long *Utricle* altogether resembling that of *C decora*, but sometimes ¼ in long—Closely allied to *C decora*, but the infl is uniform and very different

nearly capillary, bracts not overtopping panicle *Spikes* solitary (rarely a small second added) $\frac{3}{4}$ by $\frac{1}{10}$ in, two upper male (in one case with a disjunct fem at base) ferruginous, the others fem often shortly male at top Fem *glumes* ovate acute,

triquetrous, brown —Very like *C munda*, Boott

***** Species of Sect "INDICÆ" not easily placed in any one of the preceding four subsections

85 **C. curvata,** *Boott Carex*, i 2, t 5 (non Knaf), small, leaves filiform, infl compound oblong yellow dense, spikes very small ovoid 4–6-nutted with few males at top, utricle ellipsoid plano-convex 3 nerved, glabrous beak very short oblong bifid, style 3 fid *Boeck in Linnæa*, xxxix 110

SIKKIM HIMALAYA, Tungu, alt 12–13,000 ft, *J D H* Pharee, *Dungboo*

Glabrous. *Rhizome* woody *Stems* densely caespitose, 2–6 in, sometimes curved *Leaves* overtopping the short stems, often curved, edges inrolled *Infl* $1\frac{1}{4}$ by $\frac{1}{2}$ in, lowest bract often overtopping it Lowest *partial* panicle subsessile (peduncle included in the short sheath), nearly $\frac{1}{2}$ in with 2–6 spikes *Spikes* $\frac{1}{8}$ in, nearly

86 **C. inclinis,** *Boott ms*, stems 4–9 in slender 4–6 spiked, leaves much overtopping infl narrow, spikes solitary nearly all male at top terminal usually fem at base, style 3 fid, utricle narrow ellipsoid trigonous nearly nerveless, beak $\frac{1}{4}$–$\frac{1}{2}$ length of utricle *C setigera, var δ inclinis, Boott ms*

SIKKIM HIMALAYA, Tonglo, alt 10 000 ft, and Lachen, alt 12–13,000 ft, *J D H*, &c

Glabrous, except minutely hairy utricles *Rhizome* creeping, stolons elongate, rather slender *Leaves* numerous, 1 ft (and upwards) by $\frac{1}{8}$ in —Out of 17 terminal *spikes* 2 are wholly male, 15 fem (usually only a few distant utricles) at base *Spikes* solitary $\frac{3}{4}$ by $\frac{1}{8}$ in, male glumes dark red Fem *glumes* ovate lanceolate, mucronate, not quite reaching beak of utricle —Technically near *C composita*, Boott

87 **C. fragilis,** *Boott Carex*, i 7, t 21, stem very slender, leaves about as long as stem narrow, peduncles 3–6 very distant filiform spikes male basal fem distant style 3 fid, utricle (unripe) oblong-obovoid minutely scabrous hairy, beak linear $\frac{1}{3}$–$\frac{1}{2}$ utricle *Boeck in Linnæa*, xl 383

slender the 2 or 3 basal fems distant. Fem ... muticous. *Utricle* very obscurely few- ... llected at the same place by J D H, the material of both being scanty, and the fruits of *C fragilis* only half ripe, it is not

safe to unite them C fragilis differs by the extreme slenderness of the infl and peduncles, and by lowest bract not (or scarcely) overtopping infl.

88 **C. [illegible]**

[illegible]

MUNIPOOR, Jopoo, alt 9000 ft Watt (n 6894)

Glabrous. Rhizome woody Stems appr [illegible] 6–8 in Leaves subbasal, [illegible]

89 **C. speciosa,** *Kunth Enum* ii 504 leaves long spikes 3–1 very remote linear fem at base, style 3 fid fem glumes short ovate muticous, utricle ovoid pyramidal many striate green puberulous hardly beaked *Boott Carex* i 53, *Boeck in Linnæa* xl 388 *C B Clarke in Journ Linn Soc* xxv 82 C concolor *Nees in Wight Contrib* 125 (*not R Br*) C peduncularis, *Wallich ms* C courtallensis *Nees ms*, *ex Boott Carex*, i. 52 t 138.

Widely distributed in INDIA alt 1 7000 ft, from Nepal to Sikkim and Khasia Hills to Muneypoor, also [illegible] Parasnath, and Mts of S India —DISTRIB Borneo

Glabrous *Rhizome* woody short with tough fibres (remains of lower sheaths) *Stems* 1 [illegible] ft slen[illegible] times scarcely [illegible] usually very short, (perhaps a stem) by ¼ in Fem glume triangular tipped [illegible] muticous short r than utricle *Utricles* ⅛ in, trigonous, [illegible] flated mouth nearly entire *Nut* oblong obovoid, ¾ utricle, black, style (and its 3 branches) short, style-base scarcely dilated.

90 **C. radicalis,** *Boott Carex* i 56 t 147 leaves subradical many exceeding the slender stems, spikes 2–1 very remote broad ovoid ¼ in diam, style 3-branched, utricle ovoid many ribbed hairy *Boeck in Linnæa*, xxxix 10

SIKKIM HIMALAYA Lachen alt 10–11 000 ft *J D H*

Glabrous, except utricle *Rhizome* oblique woody *Leaves* 10 by 1/15 in., many. *Stems* almost capillary sometimes 2 from one sheath sometimes with a leaf and peduncle in the middle *Spike* irregular, sometimes of 2 or 3 obscurely fused into one head pale *Fem glumes* ovate triangular 1 nerved, lower mucronate, lowest bract like sometimes 1 in *Utricle* few, small, with no linear beak, dull green

91 **C. curticeps,** *C B Clarke*, leaves as long as stem narrow, spikes 2–14 very long approximate several terminal often male or with few fem at base fem glumes ovate usually cuspidate, style 3 fid, utricle ⅛ in and upwards elongate lanceolate nerveless glabrous, beak ⅓ as long as utricle

SIKKIM HIMALAYA alt 10 12 000 ft., common, *C B Clarke*

Glabrous Stems 1–2 ft *Leaves* rarely more than ⅛ in broad, *Infl* ½ 2½ in long Fruiting *spikes* 2–3½ in long, glumes ⅛ in apart, ⅛ in long *Utricle* altogether resembling that of *C decora*, but sometimes ¼ in long —Closely allied to *C decora* but the infl is uniform and very different

GURWHAL, alt 13–14,000 ft, *Duthie* (n 4499), SIKKIM, alt 11–15,000 ft., *J D H* &c

May be esteemed a var of *C atrata*, but the utricle is not ½ the breadth, so that the nut though smaller than that of *C atrata*, nearly fills it The lowest peduncle is usually less than ½ in, the glumes are acuminate to a long linear obtuse black point exceeding the utricles.

Var β *glacialis*; stems 2–6 in, leaves much shorter than stems, spikes very small (sometimes ⅓ by ⅙ in), utricles small very little inflated C atrata *var* glacialis, *Boott Carex*, iii 114, t 365 —N Sikkim, alt 15–17,000 ft, *J D H*

97 **C. nivalis,** *Boott in Proc Linn Soc* i 256 and *in Trans Linn Soc* xx 136 and *Carex*, i 13, t 35 (*partly*), terminal spike wholly male or fem at top, utricle broad much compressed often of thin texture with minute beak nut stalked exceedingly small (otherwise as *C atrata*) *Strachey Cat Pl Kumaon* 73, *Boeck in Linnæa*, xl 400 C cinnamomea & Griffithii, *Boott in Proc Linn Soc l c* 257, 286, and *in Trans Linn Soc l c* 136 138 C. Oliveri, *Boeck in Flora*, lxiii 455, and *in Journ Linn. Soc* xviii 104

HIMALAYA and W TIBET, alt 11–17,000 ft, common, from the KARAKORUM, *Thomson*, &c, to SIKKIM, *J D H*—DISTRIB Cabul, Central Asia

Boott states (Carex, i 13) that he finally doubted whether this was distinct from

in *C atrata*) there occur alpine forms with stems 2–3 in high It appears from Fischer's collections that Ledebour, Turczaninow, &c, must have included this under *C atrata*—*C Griffithii* Boott is founded on Griffith, n 78, which has in the four infl of this number, the terminal spike wholly male, and is so described by Boott Subsequently Boott mixed with this (undoubtedly correctly) both in Kew Herb and

Boott reduces his *C cinnamomea* to his *C nivalis*, but does not refer to his *C Griffithii*

98 **C. psychrophila,** *Nees in Wight Contrib* 127, spikes approximate cylindric lowest peduncled style 3 fid, utricles ellipsoid trigonous smooth pale green suddenly narrowed into a linear oblong scabrous beak not inflated *Kunth Enum* ii 463, *Strachey Cat Pl Kumaon*, 73, *Boott Carex* i 70 t 191 (excl *Royle*, n 112), *Boeck in Linnæa*, xl 402 C asperula, *Nees l c* 124, *Kunth l c* 433 (*not of Turcz*) C parvibracteata, *Nees l c* 125, *Kunth l c* 433 C celsa, *Boott l c* iii 108, t 330

HIMALAYA from KASHMIR, alt 8–10,000 ft, *C B Clarke*, to SIKKIM, alt. 12,000 ft., *J D H*, frequent.

Glabrous. *Rhizome* creeping. *Stems* 1 2 ft, rather slender. *Leaves* ⅔ as long as stems, ⅙–⅛ in wide, weak *Spikes* ¾ ⅜ by ⅙ in (in fruit), dense, terminal spike nearly always fem at top, occasionally wholly male, lowest spike often 1–2 in distant, on a peduncle ½–1½ in *Glumes* small, ovate, triangular tipped, chestnut, with or without a yellowish keel *Utricle* small, obscurely nerved, thin; nut black, nearly filling utricle; exsert part of the 3 style-branches much shorter than utricle (beak included), beak about ⅓ utricle, rather deeply 2-fid —Not nearly allied to the

preceding group, perhaps near *C alopecuroides* —Boott has included Royle, n 112 (the sole foundation of *C obscura*, Nees) in his *C psychrophila* Subsequently Boott (Carex, iii 108 in Obs) reduces *C parvibracteata*, Nees (which is *C psycrophila*) to *C obscura*, Nees

Sect. 7 PROPRIÆ Terminal spike wholly male (In *C ustulata* and *C. alopecuroides* frequently, in some others very rarely, there occur terminal spikes male at base fem at top)

* Utricle glabrous (or scabrous on margins), beak 0 or very short

C. [illegible] iv 216 and [illegible] st peduncle [illegible] 3 hd utricles [illegible] beal hardly any *Kunth Enum* ii 432, *Boott Carex*, iv 211, *Turcz Fl Baikal Dahur* ii (pars 1) 269 *a* only *Boeck in Linnæa*, xl 399 C nigra var *β Trevir in Ledeb Fl Ross* iv 288 C nigra, var orientalis, *Regel Descr Pl fasc.* viii 28. C atrata *Boott ms* (*partly*) C Moorcroftii, var *Boott ms.* C nivalis, *Boeck ms* (*partly*)

KASHMIR, alt 9 12,000 ft, *Thomson*, &c, *C B Clarke* —DISTRIB Central Asia, Cabul

Stoloniferous *Stems* 6–24 in *Leaves* numerous, often nearly as long as the stem, $\frac{1}{8}$ in broad lower sheaths very pale brown *Infl* usually 1–2 in, longer than lowest bract *Spikes* $\frac{1}{4}$ by $\frac{1}{4}$ in *Glumes* nearly uniform black red or with a [illegible]

in the Central Asian plant Boeckeler and Boissier say that *C nigra* mainly differs by not being stoloniferous, but *C nigra is plentifully stoloniferous* *Treviranus* therefore unites *C melanantha* with *C nigra*, it has the same general aspect, but *C nigra* has a totally different much compressed utricle *C parviflora* C A. Meyer (Enum Pl Cauc p 30) which includes *C salulosa*, Turcz and *C melano-* [illegible] n general aspect, it is [illegible] India, and to have been [illegible] utricle more acuminated

100 **C. Moorcroftii,** *Falconer ms ex Boott in Proc Linn. Soc* xx. (1851), 140, and *Carex* i 9, t 27, spikes larger brighter than in *C melanantha*, glumes black red or paler, terminal spike often pale, utricle larger pale upwards, otherwise as *C melanantha* *Strachey Cat Pl Kumaon*, 73, *Boeck in Linnæa*, xli 179 C melananthа, β baicalensis, *Turcz Fl Baikal Dahur* i 270 C melanantha, var *Boott ms*

[illegible] ORUM to TIBET (N. of [illegible] IB Central Asia. [illegible] the Russian botanists [illegible] kes look very different [illegible] whereas in *C melan-antha*, the dull black-red tops of utricles are concolorous with glumes. *C. Moor-croftii* is sometimes nearly 2 ft high, with spikes $\frac{1}{2}$ in. in diam

101 **C. supina,** *Wahl in Handl Vet Acad Stockh* 153, [illegible] rhizome slender creeping, spikes approximate sessile small, one t[illegible]

353 (excl var β), Boeck in Linnæa, xli 277—NILGHIRI HILLS, alt 7000 ft., C B Clarke, n. 11,061 CEYLON, alt. 5000 ft, Thwaites (C P 3138).—Stems 2-10 in, very slender Leaves overtopping stem, ⅛ in broad Spikes shorter, reduced sometimes to 2-4 flowers Utricle wider than in C Jackiana type, stretched tight on the large nut, shining not lurid, obscurely striate, base obconic, beak narrow minutely scabrid —This differs a good deal from C Jackiana, and is regarded by Boeckeler (who transposed the name) as specifically different from the Khasian species Boott subsequently marked the plant as C Jackiana, but he had of it only immature examples

107 **C. fusiformis,** *Nees in Wight Contrib* 128, spikes 6-12 loosely panicled, uppermost one male, lower female long linear lax interrupted, female glumes pale mucronate, style 3 fid, utricle ellipsoid rather suddenly narrowed into oblong linear beak glabrous slenderly striated. *Kunth Enum* ii. 471, *Strachey Cat Pl Kumaon*, 73, *Boott Carex*, i. 14, t 111, *Duthie in T E Atkinson Gaz* x 616, *Boeck in Linnæa*, xli 248

TEMPERATE HIMALAYA, Mussoorie, *Royle*, n 88, Kumaon alt 7000 ft, [illegible] chen alt. 10-12,000 ft., *J D H* [illegible] 12 by ⅛ in, flat. Lower fem *spikes* often [illegible] bracts about as long as infl *Fem glumes* [illegible] f spike aristate *Utricle* ⅙-⅕ in, slender, green, inconspicuously 10-nerved, beak as long as utricle, with a few microscopic scabrous points, notched *Nut* ellipsoid, filling the utricle, pale, style branches shortly exsert —General appearance of *C sylvatica*

108 **C finitima,** [illegible] glumes (from the middle of the female [illegible] short lanceolate point not aristate (oth[illegible] *Boeck in Linnæa*, xli. 247

SIKKIM HIMALAYA, alt. 9-12,000 ft, frequent, *J D H*, *C B Clarke*—DISTRIB China

Stems 1-3 ft *Spikes* more numerous than in *C fusiformis* often several from one sheath, terminal not rarely fem in the middle *Utricle* hardly nerved, some what suddenly contracted into a long linear beak.

Var β *attenuata*, slender, leaves shorter ⅛ in wide, spikes fewer about 1 in, utricles rather smaller —Khasia Hills, Vale of Rocks, alt 4,00 ft, *C B Clarke* (n 43 67o) —*Stems* 8-12 in *Leaves* much shorter than stems This appears more different from *C finitima* than is *C fusiformis*

109 **C. breviscapa,** *C B Clarke*, stem very short far outtopped by leaves, spikes 8-14 linear greenish uppermost one male glumes distant obtuse, style 3 fid, utricle broad lanceolar very angular many nerved glabrous nut narrow rhomboid truncate at top C Jackiana, var β, breviculmis, *Thw Enum* 356, *Trimen Cat Pl Ceylon*, 104 (*not of Boott*)

CEYLON, Ambagowa District, *Thwaites* (C P 3781.)

Glabrous *Stems* 1 2 in. excl of infl. 2-5 in *Leaves* 2 ft. by ⅛ in, tough, many-nerved *Infl* narrow, lower peduncles 1½ inch, erect, carrying 2 4 spikes, bracts overtopping *Fem spikes* 1 by ⅛ in, male ½-¾ in., very slender *Fem glumes* much shorter than utricle, elliptic, yellowish with green back. *Utricles* ⅙ in, green, passing gradually into conic deeply-notched beak *Nut* trigonous, elongate rhomboid, truncate at top closely fitting utricle —Much more like *C fusiformis* than *Jackiana*; but the nut is distinctive, and impresses its peculiarities on the utricle

110 **C. japonica,** *Thunb Fl Japon* 38, stolons long slender, stems medium almost 3 winged, spikes about 5 close together uppermost one male

(occasionally fem at base) small lower fem cylindric very dense rigid pale, style 3-fid, utricle ovoid glabrous suddenly contracted into a linear-conic beak *Schk Riedgr* i 115, t Ww, fig 110, *Kunth Enum* ii 517 C. japonica, β minor, *Boott Carex*, ii 88. C chlorostachys, *Don in Trans Linn. Soc* xiv 330 and *Prodr* 43 C Doniana, *Spreng Syst* iii 825, *Nees in Wight Contrib* 128, *Kunth l c* 503, *Boott in Perry Exped Jap* ii 327 (Donniana) C Motoskei, *Miq in Ann Mus Lugd Bat* ii. 148. C trichostyles, *Franch et Savat*, *Pl Japon* ii 152, 581 —Carex, *Wall. Cat.* 3395

NEPAL, *Wallich* SIKKIM HIMALAYA, *Herb Griffith* (*Kew Distrib* n. 6079) KHASIA HILLS, alt 5500-6000 ft, frequent, *C. B Clarke* —DISTRIB Japan

Description of Khasian plant —Glabrous *Rhizome often 8 in very slender*, with pale brown scales *Stems* 6-15 in, rather stout, very acutely triquetrous. *Leaves* often as long as stem, $\frac{1}{6}$-$\frac{1}{4}$ in broad Fem *spikes* $\frac{1}{2}$-1 by $\frac{1}{4}$ in, very short-peduncled, suberect, green or yellowish, when young almost comose from the brown-red styles, terminal spike small, almost concealed among the fem. spikes, bracts far overtopping infl Fem *glumes* ovate-lanceolate, aristate, green with scarious margins, hardly so long as utricle *Utricles* $\frac{1}{8}$ in, very close-packed, obliquely ascending, trigonous, 8 nerved, beak narrow, notched, glabrous or most minutely scabrous *Nut* ellipsoid, subacute at both ends, filling the utricle —None of the Khasian specimens match the original *C japonica*, described by Thunb "spicis ovatis," and figured by Schkuhr (= *C aphanolepis, Franch et Savat*) The Indian *C japonica* is *C chlorostachys*, Don, which is near the following var.

Linn Soc xiv. 332 & Prodr. 43; tall, ke often as long as female frequently gradually into oblong beak. *Nees in* 258; *Boeck. in Linnæa*, xli. 172 C *num* ii 516. C. japonica, *Boott Carex*, C Doniana, *Drejer Symb.* 26, t 13.

SIKKIM HIMALAYA; alt 5-7000 ft, *J D H* KHASIA HILLS, Nunklao, alt. 4-5000 ft, *J D H*, *C B Clarke* MUNEYPOOR alt 8500 ft, *Watt* —DISTRIB. Japan

Out of 31 spikes collected by me at Nunklao 14 have the terminal spike (mostly plentifully) fem at top *Stems* much less 3-winged than in the Khasia *C japonica* Both Boott and Boeckeler have reduced this plant to *C. japonica*, Thunb., but it is very unlike it in general aspect, the principal difference I find in the male spike which is in *C japonica* short occasionally female at base, in var (?) *alopecuroides* long, frequently fem at top

111 C.

spikes
green,
obscur
beak
Linnæ
(1811),
viii 22,
Kunze Suppl 31, t. 6, fig 2 C. rigidifolia, *Seub Fl. Azor* 21, t. 2, fig 1

N KASHMIR, Indus Valley, alt. 7650-9000 ft., frequent, *C B. Clarke* KUNAWUR, alt. 11,000 ft, *Munro.*—DISTRIB Cabul and Central Asia to Lapland and the Azores.

Glabrous. *Stolons* 0 *Stems* caespitose, 6 in. to 3 ft. *Leaves* very variable (in Indian examples) sometimes less than $\frac{1}{4}$ length of stems $\frac{1}{8}$ in. broad, sometimes 20

by ½ in ; bracts similarly varying Lower *spikes* always distant, peduncle sometimes hardly exsert from the sheath with erect rigid spike, sometimes much longer with nodding spike (in Kunawur examples capillary with slender spike) 3–5 upper spikes not rarely fascicled. Mal
Fem *spikes* commonly ½ 1
⅓ in wide, much looser)
linear triangular back green excurrent in a scabrous cusp *Utricle* ⅛ in , trigonous, *irregularly nerved, herbaceous, often "punctate" with ferruginous dots (often* missing in Europ and Cent As examples), oblong portion of beak about ⅓–½ length of utricle, glabrous or slightly minutely scabrous. *Nut* filling utricle, obovoid-ellipsoid, trigonous —The identification of *C punctata*, Gaudin, with *C diluta*, *M Bieb* is due to *Trevirarus* (Bull Soc Nat. Mosc 1863, i 541), and is accepted by Trautvetter, while Regel (*Act Hort Petrop* vii 573) and Boissier admit both species in Asia The common Indus Valley plant appears to me identical with the European *C punctata*, Gaudin

C. M .. l.

style 3 fid utricle ellipsoid trigonous imperfectly nerved thin glabrous, narrowed into a short oblong linear beak C chinensis, *Munro ms* C diluta, var *Boott ms*

KUNAWUR alt 11 500 ft *Munro* (n 2431)
Glabrous *Ste*
11 in from the
shorter than
sub sessile
allied to *C Chinen*
texture and cl
both the examples preserved there is a utricle at base of the terminal male spike

113 **C. ferruginea,** *Scop Fl Carniol* ii 225, spikes 3–7 distant, terminal one male, lower fem cylindric long peduncled nodding brown glumes *equalling utricle ovate acuminate, style 3 fid, utricle ellipsoid* glabrous beak lanceolate longish notched scabrous on edges *Reichb Ic Fl Germ* viii 21, t 248, *Boott Carex*, iv 207, *Boeck in Linnæa*, xli 228 C Mielichhoferi, *Schk Riedgr* ii 66, t. Mmmm fig 198, *Kunth Enum* ii 466

KASHMIR, Pir Punjal, alt 11,000 ft, *C B Clarke* —DISTRIB Alpine Europe and (if *C Scopoliana* Willd be included) Central Asia

Glabrous, brownish *Stems* 1 ft. *Leaves* nearly as long as stem, in broad flat *Spikes* all distant, ¾–1 in , bracts sheathing *Glumes* (male and fem similar) castaneous red with green backs often mucronate *Utricle* quite glabrous in the Indian example (as in Scopoli's description and in Schkuhr's *C Mielichhoferi*), beak lanceolate linear triangular, plane, subconcave on post cous face, glabrous but very scabrous on edges —*C Scopoliana* Schk Riedgr ii 77, t Nnnn, fig 199 has utricle hispid somewhat subovoid suddenly narrowed into a small oblong beak This is united (perhaps rightly) with *C ferruginea*, Scop (*not Schk*) by Boott and Boeck)

114 **C. tristis,** *M Bieb Fl Taur Cauc* iii 615, leaves flat, spikes 6–8 cylindric, uppermost 3 usually male, lower fem distant peduncled suberect, fem glumes ovate hardly mucronate, style 3 fid, utricle ellipsoid trigonous glabrous fulvous hispid on angles suddenly narrowed into linear shortly notched beak *Kunth Enum* ii 465 C sempervirens, *Villars*, var γ, *Boott Carex*, iv 218, *Boeck in Linnæa*, xli

227. C Schottii, *Boiss Diagn.* ser 2, iv 123 C macrogyna, *Turcz.* (*not of Boott, cf Turcz. Fl Baical Dahur.* ii 284)

N Kashmir to the Karakorum, alt 13–15,000 ft, *C B Clarke* —Distrib. Central Asia

Glabrous *Stolons* 0 *Stems* 1-2 ft, rather slender, trigonous *Leaves* rarely ½ the stem, ⅛–¼ in broad *Spikes* chestnut purple, fem ¾ by ¼ in, lowest peduncle

115 **C. flava,** *Linn Sp Pl* 1384, spikes 3–6 approximate (or lowest somewhat distant) terminal one male, lower fem short-cylindric dense, fem glumes ovate, style 3 fid, utricle ovoid
cent suddenly narrowed into oblong lin
ii 56, t. H fig 36, *Kunth Enum* iii 41(
273, *Ledeb Fl Ross* iv 299, *Boeck in*
Gram Austr i 48, t 61 C Œderi, *Willd in Act Berol* 14, t. 1, fig. 2 (*fide Kunth*), *Reichb l c* 29, t 272 C lepidocarpa, *Tausch. ms*, *Kunze Suppl* 52, t 13 fig 2, *Reichb Ic Fl Germ.* viii 29, t. 272

Kashmir, alt 6 11,000 ft, *Jacquemont, Thomson*, &c —Distrib. N temp regions, Tasmania (?)

Glabrous *Stolons* 0 *Stems* caespitose, 1½–20 in *Leaves* often ¾ length of stem, ⅛–⅙ in broad *Spikes* commonly all approximate, sessile sheath hardly any, or, if one spike is distant, that is peduncled in a distinct sheath (the rule throughout the genus) Fem *spikes* commonly ¼–½ by ⅕ in, sometimes larger, often much smaller, beaks of ripe fruit stellately spreading or deflexed, rarely obliquely erect.
s or rarely
, beak with
e, obovoid,
..mples show
, the spikes
varying greatly in size, the beaks of the ripe fruit spreading, or deflexed, or rarely obliquely erect

1 C.
3–5
fem
or e
ress
130
Linn Soc. xx 141 C nutans, *Boeck. in Journ Linn Soc.* xviii 105 & (*var.* microcarpa) in *Linnæa*, xli 297.

N Kashmir; alt 8–10,000 ft, *C B Clarke* —Distrib Cabul, Central Asia, Mandschuria

Glabrous *Rhizome* short, horizontal, woody *Stems* 1-2 ft. *Leaves* often ¾

remarkably truncate, sessile; teeth of beak deep, spreading curved. *Nut* long, ellipsoid, pyramidal at both ends, trigonous, dark brown —If Boeckeler be followed in treating *C songorica* as a var. of *nutans*, Host, all the Indian (and neighbouring) material will belong accurately to that var.

by ¼ in., bracts similarly varying Lower *spikes* always distant, peduncle sometimes hardly exsert from the sheath with erect rigid spike, sometimes much longer with nodding spike (in Kunawur examples capillary with slender spike); 3–5 upper spikes not rarely fascicled. Male *spike* ¾–1½ in, pale brown, glumes hardly mucronate Fem. *spikes* commonly ½–1 by ¼ in., dense, not rarely slenderer (in Kunawur hardly ⅛ *in wide, much laxer*) *Fem glumes shorter than utricle, ovate, thin, pale brown*, linear-triangular back green excurrent in a scabrous cusp *Utricle* ⅛ in, trigonous, irregularly nerved, herbaceous, often "punctate" with ferruginous dots (often missing in Europ and Cent. As examples), oblong portion of beak about ½–⅓ length of utricle, glabrous or slightly minutely scabrous. *Nut* filling utricle, obovoid-ellipsoid, trigonous —The identification of *C punctata*, Gaudin, with *C diluta*, M Bieb is due to Treviranus (Bull Soc Nat. Mosc 1863, i. 541), and is accepted by Trautvetter, while Regel (*Act Hort Petrop* vii. 573) and Boissier admit both species in Asia The common Indus Valley plant appears to me identical with the European *C punctata*, Gaudin

C [illegible]

[illegible]

narrowed into a short oblong linear beak C chinensis, *Munro ms* C. diluta, var *Boott ms*

KUNAWUR, alt. 11 500 ft *Munro* (n 2431)

Glabrous *Stems* 3 ft *Leaves* 18 by ⅛ in, flat Lowest *peduncle* 2 in, distant 11 in from the next *Spikes* ¾–1½ by ⅛–¼ in drooping rather lax Fem *glumes* shorter than utricle, ferruginous brown, green 3 nerved on back *Utricle* 1/6 in, subsessile wall of thin loose texture pale, beak very shortly bifid, smooth —Perhaps allied to *C Chinensis* which has erect less distant spikes and hairy utricles The texture and character of the utricle is much like that in *C diluta*, M Bieb In both the examples preserved there is a utricle at base of the terminal male spike

113 **C. ferruginea,** *Scop Fl Carniol* ii 225, spikes 3–7 distant, terminal one male, lower fem cylindric long peduncled nodding brown, glumes equalling utricle ovate acuminate, style 3 fid, utricle ellipsoid glabrous beak lanceolate longish notched scabrous on edges *Reichb Ic Fl Germ* viii 21, t 248, *Boott Carex*, iv 207, *Boeck in Linnæa*, xli 228 C Mielichhoferi, *Schk Riedgr* ii 66, t. Mmmm, fig 198, *Kunth Enum* ii 160

KASHMIR, Pir Panjal, alt 11,000 ft, *C B Clarke* —DISTRIB Alpine Europe and (if *C Scopoliana* Willd be include l) Central Asia

Glabrous, brownish *Stems* 1 ft. *Leaves* nearly as long as stem, in broad, flat *Spikes* all distant, ¾–1 in, bracts sheathing *Glumes* (male and fem similar) castaneous red with green backs, often mucronate *Utricle* quite glabrous in the Indian example (as in Scopoli's description and in Schkuhr's *C Mielichhoferi*), beak lanceolate linear triangular, plane, subconcave on posticous face, glabrous but very scabrous on edges —*C Scopoliana*, Schk Riedgr ii 77, t Nnnn, fig 199 has utricle hispid somewhat subovoid suddenly narrowed into a small oblong beak This is united (perhaps rightly) with *C ferruginea, Scop* (*not Schk.*) by Boott and Boeck)

114 **C. tristis,** *M Bieb Fl Taur Cauc.* iii 615, leaves flat, spikes 6–8 cylindric, uppermost 3 usually male, lower fem distant peduncled suberect, fem. glumes ovate hardly mucronate, style 3 fid, utricle ellipsoid trigonous glabrous fulvous hispid on angles suddenly narrowed into linear shortly-notched beak *Kunth Enum* ii 465 C sempervirens, *Villars*, var γ, *Boott Carex*, iv 218, *Boeck in Linnæa*, xli

227 C Schottu, *Boiss Diagn* ser 2, iv 123 C macrogyna, *Turcz (not of Boott cf Turcz Fl Baical Dahur* ii 284)

N Kashmir to the Karakorum, alt 13–15,000 ft, *C B Clarke* —Distrib Central Asia

Glabrous *Stolons* 0 *Stems* 1 2 ft rather slender, trigonous *Leaves* rarely ½ the stem, ⅛–¼ in broad *Spikes* chestnut-purple fem ¾ by ¼ in, lowest peduncle often 3 5 in distant exsert 2–4 in bracts not overtopping nll ... style scarcely microscopically pubescent

115 **C. flava,** *Linn Sp Pl* 1384, spikes 3–6 approximate (or lowest somewhat distant) terminal one male, lower fem short cylindric dense, fem ... ed ribbed glabrous flaves ... *Schk Riedgr* i 72 and ... *b Ic Fl Germ* viii 30 t ... xli 272 C pitula, *Host Gram Austr* i 48 t 64 C Œderi, *Willd in Act Berol* 44, t 1, fig 2 (*fide Kunth*), *Reichb l c* 29, t 272 C lepidocarpa, *Tausch ms*, *Kunze Suppl* 52, t 13 fig 2, *Reichb Ic Fl Germ* viii 29, t 272

Kashmir, alt 6–11,000 ft, *Jacquemont, Thomson, &c* —Distrib N temp regions Tasmania (?)

Glabrous *Stolons* 0 *Stems* caespitose, 1½–20 in *Leaves* often ⅔ length of stem, ⅛–⅙ in broad *Spikes* commonly all approximate, sessile sheath hardly any; or, if one spike is distant, that is peduncled in a distinct sheath (the rule throughout the genus) Fem ... smaller, beaks ... Fem *glumes* ov... mucronate *Utr* ... an oblique small ... trigonous —Boot... the same range ... varying greatly in size, the beaks of the ripe fruit spreading, or deflexed, or rarely obliquely erect

116 **C. songorica,** *Karel et Kiril in Bull Soc Mosc* iii 125 spikes ... nse, ... void ... beak sessile subtruncate at base *Boott Carex* iv 200, *Boiss Fl Orient* v 1.0 C Gebleri *Prescott ms ex Boott in Proc Linn Soc* i 261 & *in Trans Linn Soc.* xx 141 C nutans, *Boeck in Journ Linn Soc.* xviii 105 & (*var* microcarpa) in *Linnæa*, xli 297

N Kashmir, alt 8–10,000 ft, *C B Clarke*.—Distrib Cabul, Central Asia, Mandschuria

Glabrous *Rhizome* short, horizontal, woody *Stems* 1 2 ft *Leaves* often ½ stems ⅛–⅙ in broad Male *spikes* often pale, narrow sometimes ...

117 **C. rostra**' ı· .
distant erect, uppe
glumes lanceolate .
inflated thin narro
pullacea *Go len* ı . .
Ic Fl Germ viii 31, t 277, *Boott Carex*, iv 156, t. 501

KASHMIR *Jacque sont*, alt 10 11,000 ft, *Thomson*, alt 8–13,000 ft, *C B Clarke* LAHOUL, *Jaeschke*—DISTRIB Cool Northern regions

Glabrous. Stoloniferous *Stems* 2–3 ft, robust *Leaves* often ¾ the stem, ¼ in broad, scabrous near tip Male *spike* 1½ by ¼ in Lowest *fem spike* 1–1½ by ⅓ in often 3 in distant on a peduncle 0 ½ in. Fem *glumes* purple chestnut with ... e European) *Utricles* ... the utricles are ovoid ... of utricle 6–8, incon... ked through), beak in sterile utricles about ¼ as long as utricles linear conic, in fertile utricles much

118 **C. vesicaria,** *Linn Sp Pl* 1388 (*partly*) spikes longer than in *C rostrata*, fem. glumes ovate-lanceolate mucronate or short aristate pale, utricle rather larger than in *C rostrata*, beak deeply notched with 2 conspicuous shining lanceolate rigid teeth (otherwise as *C rostrata*) *Kunth Enum* ii. 494 *Reichb Ic Fl Germ* viii 50 t 276, *Boott Carex*, iv 162, tt 536, 537, *Boeck in Linnæa*, xli 319

KASHMIR, *Margan Pass*, alt 11 500 ft *W S Atkinson*—DISTRIB Cold temp N regions

Male *spikes* 2½ in and up to 1½ in apart (in the Kashmir examples) Fem *spikes* up to 3 by ⅓ in, both glumes and utricles pale stramineous —Atkinson s collection is copious, though not fully ripe, Mr Baker says it is "satisfactory *vesicaria*"

C. ...

xli 321

KASHMIR, alt 6000 ft, *Thomson*, Pir Punjal, alt 11 000 ft, *Levinge*—DISTRIB Cool N regions

Glabrous *Stolons* 0 *Stems* 2½ ft *Leaves* often longer than stem, ⅙–¼ in broad flat *Spikes* 1–3 in long, lowest 1–3 (*rarely* 4–6) in distant *Utricles* ⅙ in ultimately divaricate green or yellowish, beak about half as long as utricle, deeply notched *Nut* ovoid, somewhat narrower than utricle and about half as long, brown.

120 **C. acutiformis,** *Ehrh Beitr* iv 43 spikes 3–7 distant erect uppermost 3–2 male chestnut red, fem cylindric dense, fem glumes elliptic lanceolate not aristate, style 3 fid, utricle ovoid or ellipsoid inflated thin obliquely erect fuscous glabrous obscurely nerved, beak short, nut very small *Boeck in Linnæa*, xli 289 C spadicea, *Roth Tent* ii

461 C paludosa *Gooden in Trans Linn Soc* ii 202, *Nees in Wight Contrib* p 129, *Anderss Cyp Scand* 17, *Kunth Enum* ii 487, *Reichb Ic Fl Germ* viii 28 t 266, *Boott Carex* iv 214 C Kochiana, *DC Hort Monsp* 89, *Reichb l c* t 271

KASHMIR, alt 7000 ft *Thomson* NEPAL, *Royle* (n 130) —DISTRIB Cool N temp regions

This differs from *C rostrata* and *C vesicaria* by the thick dark colrd male spikes, the suberect (not divaricate) ripe utricles, the fuscous lurid grey colour of utricles with shorter beak —In Jaeschke s Lahoul collections is a young *Carex* with 11 spikes, the lower peduncles carrying 3 4 spikes, style 3-fid, utricle glabrous, it is too young for determination and resembles generally *C acuta* rather than *C acutiformis*, but the style is 3 fid so that it must be placed here

121 **C. tumida,** *Boott Carex* i 66, t 181, spikes 5–6 suberect, terminal one male long linear lower fem short peduncled distant long-cylindric dense, fem glumes lanceolate short aristate pale, style 3 fid, utricle ellipsoid fuscous glabrous suddenly narrowed into a conic linear shortly notched beak *Boeck in Linnæa*, xli 243

SIKKIM HIMALAYA, alt 9000 ft, *J D H*, alt 5000 ft, *C B Clarke* KHASIA HILLS, Shillong, alt 6000 ft *C B Clarke*

Glabrous *Stem* is 12–18 in *Leaves* longer than stem, ¼–⅓ in broad Terminal *spike* 2 in, very narrow, pale Lower *spikes* fem 2–3 by ¼ in ripe fruits obliquely suberect Fem glumes narrow lanceolate, 3 nerved, stramineous, shorter than utricle, aristate or muticous, bracts much overtopping infl *Utricle* ⅙ in, not inflated, thin, obscurely nerved lurid slate colrd, beak nearly as long as utricle its lower half conic *Nut* obovoid ellipsoid, trigonous, filling utricle —The swelling in the middle of the beak, figured and insisted on by Boott, is taken from a single (not well ripe) collection, in well ripened fruits the lower half of the beak is conic the upper narrow oblong it is hardly possible to describe it as tumid in the middle

122 C. [illegible]
Soc xx. [illegible]
lower fe [illegible]
glumes l [illegible]
glabrous finally deflexed suddenly narrowed into a short linear notched beak C confertiflora *Boott in Mem Am Acad* N S vi [1859] 418, *Carex*, iv 184, *Franch & Savat Pl Japon* ii 151, 578

SIKKIM, Terai, *J D H* ASSAM alt 300 1000 ft, frequent, *C B. Clarke*, &c. CACHAR, *Keenan* —DISTRIB Java, Japan

Taller and stouter than *C tumida* Boott, leaves in Hooker's examples up to [illegible]

C. [illegible] 14, spikes 4–6 [illegible] brown, glumes [illegible] id, utricle ovoid somewhat inflated black red glabrous nervose suddenly narrowed into a linear shortly-notched beak *Boott Carex*, iv. 190, *Thw. Enum* 356, *Boeck in Linnæa*, xli 244. C Arnottiana, *Boott in Proc. Linn. Soc* i.

117 **C. rostr**...
distant erect, uppe...
glumes lanceolate...
inflated thin narro...
pullacea *Go*...
Ic Fl Germ viii 31, t 277, *Boott Carex*, iv 150, t. 501

KASHMIR, *Jacquemont*, alt 10 11,000 ft, *Thomson* alt 8–13,000 ft, *C B Clarke* LAHOUL, *Jaeschke*—DISTRIB Cool Northern regions

Glabrous. Stoloniferous. *Stems* 2 3 ft, robust *Leaves* often ¾ the stem, ¼ in broad, scabrous near tip Male *spike* 1½ by ⅙ in Lowest *fem spike* 1–1½ by ⅓ in, often 3 in distant on a peduncle 0–½ in. Fem *glumes* purple chestnut with narrow pale back (in the Indian examples, often pale in the European) *Utricles* (fertile) ⅙ in long ellipsoid, longer than glume, but many of the utricles are ovoid more inflated (with sterile nut) shorter than glume, ribs of utricle 6–8, inconspicuous (till the nut is taken out and the wall of utricle looked through), beak in sterile utricles about ⅓ as long as utricle linear conic, in fertile utricles much shorter, shortly 2 fid with erect teeth *Nut* (perfect) very small, not ½ length or breadth of utricle obovoid, dark brown —This Indian *C rostrata* is so referred by Boott, and is conspicuous by the narrow chestnut purple glumes imperfectly covering the pale (nearly white) utricles, the beak of the fruit is very little split Mr Baker says "it is not at all good *C ampullacea*"

118 **C. vesicaria,** *Linn Sp Pl* 1388 (*partly*), spikes longer than in *C rostrata*, fem. glumes ovate lanceolate mucronate or short-aristate pale, utricle rather larger than in *C rostrata*, beak deeply notched with 2 conspicuous shining lanceolate rigid teeth (otherwise as *C rostrata*) *Kunth Enum* ii. 194, *Reichb Ic Fl Germ* viii 30 t 276, *Boott Carex*, iv 162, tt 536, 537, *Boeck in Linnæa*, xli 319

KASHMIR, Margan Pass, alt 11 500 ft *W S Atkinson* —DISTRIB Cold temp N regions

Male *spikes* 2½ in and up to 1½ in apart (in the Kashmir examples) Fem *spikes* up to 3 by ⅓ in both glumes and utricles pale stramineous —Atkinson s collection is copious, though not fully ripe; Mr Baker says it is "satisfactory *vesicaria*"

C. ... 387, spikes 3–7 moderately ... cylindric dense nodding, ... le 3 fid utricle ellipsoid ... ribbed, beak 2 fid in two ... *um* ii 501, *Reichb Ic Fl Germ* viii 30, t 275, *Boott Carex*, iv 140, tt 451, 452, *Boeck in Linnæa*, xli 321

KASHMIR, alt 6000 ft, *Thomson*, Pir Punjal, alt 11 000 ft, *Levinge*—DISTRIB Cool N regions

Glabrous *Stolons* 0 *Stems* 2½ ft *Leaves* often longer than stem, ⅛–⅙ in broad flat *Spikes* 1–3 in long, lowest 1–3 (rarely 4–6) in distant. *Utricles* ⅙ in, ultimately divaricate, green or yellowish; beak about half as long as utricle, deeply notched *Nut* ovoid, somewhat narrower than utricle, and about half as long, brown.

120 **C. acutiformis,** *Ehrh Beitr* iv 43, spikes 3–7 distant erect uppermost 3–2 male chestnut red, fem cylindric dense, fem glumes elliptic lanceolate not aristate, style 3 fid, utricle ovoid or ellipsoid inflated thin obliquely erect fuscous glabrous obscurely nerved beak short, nut very small *Boeck in Linnæa*, xli 289 C spadicea, *Roth Tent* ii

401 C paludosa *Goolen in Trans Linn Soc* ii 202, *Nees in Wight Contrib* p 129 *Anderss Cyp Scand* 17, *Kunth Enum* ii 487, *Reichb Ic Fl Germ* viii 28 t 266, *Boott Carex*, iv 214 C Kochiana, *DC Hort Monsp* 89, *Reichb l c* t 271

Kashmir, alt. 7000 ft *Thomson* Nepal, *Royle* (n 130)—Distrib Cool N temp. regions.

This differs from *C rostrata* and *C vesicaria* by the thick dark colrd male spikes, the suberect (not divaricate) ripe utricles, the [illegible] lurid grey colour of utricles with shorter beak —In Jaeschke's Lahoul collections is a young *Carex* with 11 spikes the lower peduncles carrying 3-4 spikes, style 3 fid, utricle glabrous, it is too young for determination, and resembles generally *C acuta* rather than *C. acutiformis*, but the style is 3 fid so that it must be placed here

121 **C. tumida,** 5-6 suberect, terminal one male long distant long- cylindric dense, fem g le, style 3 fid, utricle ellipsoid fuscou a conic linear shortly notched beak

Sikkim Himalaya, alt. 9000 ft, *J D H*, alt. 5000 ft, *C B Clarke*. Khasia Hills, Shillong, alt 6000 ft *C B Clarke*

Glabrous. *Stem* is 12-18 in *Leaves* longer than stem, ⅙-¼ in broad Terminal *spike* 2 in, very narrow, pale Lower spikes fem 2-3 by ¼ in ripe fruits obliquely subrect Fem glumes narrow lanceolate, 3 nerved, stramineous, shorter than utricle, aristate or ricle ⅙ in, not inflated, thin, obscu long as utricle its lower half conic —The swelling in the middle of the n from a single (not well ripe) collec he beak is conic the upper narrow oblong, it is hardly possible to describe it as tumid in the middle

122. **C. olivacea,** *Boott in Proc Linn Soc* i 286 & *in Trans L*[illegible] *Soc* xx 138, & *Carex*, i [illegible]6, t 149, lower fem somewhat distant shor glumes lanceolate aristate pale, sty [illegible] glabrous finally deflexed suddenly narrowed into a short linear notched beak *C confertiflora*, *Boott in Mem Am Acad* N S vi [1859] 418, & *Carex*, iv 184, *Franch & Savat Il Japon* ii 151, 578

Sikkim, Terai, *J D H* Assam alt 300 1000 ft, frequent, *C B. Clarke*, &c. Cachar, *Keenan*.—Distrib Java, Japan

Taller and stouter than *C tumida*, Boott leaves in Hooker's [illegible] ¾ in broad [illegible] with green kee [illegible] usually shorter [illegible] wards, when ri [illegible] very prominent [illegible] ellipsoid or ovoid, much smaller than utricle —Usually larger than *C tumida*; it is easily told from it when young by the much thicker deeply-colrd male spike, when ripe by the inflated deflexed utricles.

123 **C. lobulirostris,** *Dreger Symb Caric* 27, t 14, spikes 4-6 approximate large cylindric erect terminal one male dark brown, glumes lanceolate aristate dark brown fem much smaller, style 3 fid, utricle ovo somewhat inflated black red glabrous nervose suddenly narrowed linear shortly-notched beak *Boott Carex*, iv 190, *Thw Enum Boeck in Linnæa*, xli 244. C Arnottiana, *Boott in Proc Linn*

260, ♂ in *Trans Linn Soc* xx 129 (*not of Drejer*) C Neesiana, *Arnott ms* (*not of Endl*)

CEYLON, *Gardner*, &c, alt 6-7000 ft., *Thwaites*
Glabrous *Stems* 2-3 ft, rather stout. *Leaves* often overtopping stem, ¼ in broad *Spikes* very close together, subsessile, lowest sometimes 1½ in distant on a 1 in peduncle, bracts very long *Fem spikes* 2 by ½-¾ in, rigid *Utricle* ⅛ in, spreading, hardly deflexed, longer than glumes, thin but somewhat succulent, beak concolorous less than ¼ length of utricle *Nut* ellipsoid, trigonous, subsessile, pyramidal at top, shortly apiculate, dark-brown

124. **C. lurida,** *C B Clarke*, spikes 4-5 distant cylindric, terminal

SIKKIM HIMALAYA Lachen alt 9-12 000 ft, *J D H* BHOTAN, Chupcha,

of *C rostrata*, but different in colour, beak 2 fid very deeply into linear teeth finally stellately divaricate, conspicuous —Boott observes that he has never seen such *fem* glumes as these in *C rostrata*

C.

2 fid

ASSAM, Luckimpore, alt 300 ft, *C B Clarke*
Glabrous, stoloniferous *Stems* 15 in rather stout. *Leaves* overtopping stem, scarcely ¼ in broad Lowest *spike* sometimes as much as 3 in distant on a 2 in peduncle, usually much closer, bracts 1 ft Male *spike* 1½ in, glumes very green on back, aristate Fem *spikes* 1½ by ¼-⅓ in, glumes 3 nerved rather shorter than utricles, scabrous pointed *Utricle* nearly ⅙ in conically narrowed at base, somewhat inflated, exserted part of style branches hardly ½ utricle

*** *Utricle hairy or minutely setulose*

126 **C. flacca,** *Schreb Spicil Fl Lips Append* n 669, spikes 4-6 distant long cylindric, terminal 3-2 male, fem glumes ovate acute, style 3 fid rarely 2 fid, utricle ellipsoid turgid obtuse puberulous-scabrous, beak minute subentire *Host Gram Austr* i 66, t 90, t P, fig 57, & t Zz fig 113 C glauca, *Scop Carn* ii. 223, *Kunth Enum* ii 459, *Reichb Ic Fl Germ* viii 29, t 269, *Drejer Symb Caric* 20, t 6, *Boeck in Linnæa*, xli 187

SIND, *Pinwill* —Temp N Hemisphere
Glabrous, glaucous *Stolons* long, hardening into a creeping branching rhizome 15 in long in a Sind example *Stems* 8 18 in *Leaves* ⅔ stem, ⅛ in broad, harsh Fem *spikes* 1¼ by ⅛ in, dense in fruit, male spikes often longer 1¾ in in Sind examples Lowest *spike* short peduncled erect or if very remote long peduncled long sheathed, bracts usually about as long as infl *Utricle* small, about $\frac{1}{10}$ in in the Sind plant, obscurely trigonous

127 **C. setigera,** *Don in Trans Linn Soc* xiv 330, & *Prodr* 43, stoloniferous, spikes 4–8 cy
fem peduncled erect, fem
ovoid hispid suddenly narr
Wight Contrib 126, *Kunt*
189 (*excl Boott*, t 6, *cited*) C hymenolepis *Nees l c* 126, *Kunth l c* 505 C setigera, *var* minor, *Strachey Cat Pl Kumaon*, 73 (*not Boott*) — Carex, *Wall Cat* 3385

HIMALAYA, alt 7–10,000 ft, frequent, from Mussoorie, *Jacquemont*, to Sikkim, *J D H*, and Phari, *G King*

Glabrous *Rhizome* long, creeping, $\frac{1}{7}$ in in diam *Stems* 1–2 ft *Leaves* nearly as long as stem, $\frac{1}{8}$–$\frac{1}{6}$ in broad *Spikes* 1½–2 in long (in the typical C *hymenolepis*, hardly half as much in the var *chroolepis*, Drejer), fem up to $\frac{1}{3}$ in
nms referred here), lowest fem
l at base Fem *glumes* as long
in the standard form (which is
sides and scarious margins (but
Utricle $\frac{1}{10}$–$\frac{1}{12}$ in, brown-green, very hispid, nerveless, strongly 2-edged, the concave face only obscurely ridged by the angle of nut, margined by the incurved edges *Nut* ellipsoid, trigonous, narrowed much at base, dark brown, style slender glabrous, base not dilated, exsert part of branches about as long as utricle

128 **C. Schlagintweitiana,** *Boeck Cyp Nov* i 48, stoloniferous, spikes 3–6 very small cylindric distant pale, terminal 1 (or 2) male, lowest fem peduncled erect, fem glumes ovate often mucronate, style 3 fid, utricle very small ovoid hispid suddenly narrowed into small oblong notched beak C setigera, var *β* minor, *Boott Carex*, i 2 t 6, fig 1 (not fig 2)

Thomson;

ng stem,
lly $\frac{1}{10}$ in

129 **C. inanis,** *Kunth Enum* ii 522, spikes 4–12 cylindric approxi-
s ovate sometimes mucronate, style
ispid suddenly narrowed into a small
Boott Carex, i 2, t 6 (*mostly*, i. e.
in *Wight Contrib* 126 C setigera,
umaon, 73 C setigera, *Kunth Enum*.
122), *Nees in Wight Contrib* p 120.

HIMALAYA, alt 7–10,000 ft, from Kashmir *C B Clarke*, to Sikkim, *J. D H.*

Rhizome divided, short, i e arises from lateral offsets not from elongate stolons. *Stems* 2–15 in, slender *Leaves* overtopping stem, narrow. *Bracts* very long, conspicuously overtopping infl *Spikes* (in fruit) ⅔ by ¼ in, dense, grey-green, upper often fascicled, lowest sometimes a little distant short-peduncled, occasionally carrying 3–4 spikes. Fem *glumes* frequently muticous, the midrib sometimes shortly excurrent. *Utricle* much smaller than in *C setigera*, Don, more turgid, without one face concave —Spikes much denser than those of C *setigera*, Don

130 **C. kashmirensis,** *C B Clarke*, spikes 3–6 short-cylindric approximate, terminal 1–3 male, fem glumes ovate muticous, style 3-fid, utricle ellipsoid lanceolate trigonous hispid acuminated into oblong deeply bifid beak C hirtella, *Boott ms* (*partly*).

KASHMIR, alt 10–15,000 ft, *Thomson*, frequent, *C B Clarke*.

Resembles generally *C præcox* or *C pilulifera*, but has an oblong beak to utricle ending in two scarious lanceolate teeth *Rhizome* short, creeping, divided. *Stems* 8–16 in, slender. *Leaves* all nearly basal, ⅓ length of stem, ⅛ in broad, flat. *Infl* usually 1–1½ in, bracts not (or scarcely) overtopping infl *Spikes* very close, nearly sessile, lowest fem occasionally 1–1½ in distant, then shortly peduncled.

131 **C. hæmatostoma,** *Nees in Wight Contrib* 125, spikes 4–10 linear-cylindric, uppermost 3–1 male, lower fem somewhat distant short-peduncled suberect, fem glumes ovate, style 3 fid, utricle much compressed ovoid tip triangular oblong deeply 2 fid hairy, nut stalked, style hairy *Kunth Enum* ii 514, *Strachey Cat Pl. Kumaon,* 73, *Boott Carex*, i 72, t 196, *Boeck in Linnæa,* xli 302 C macrogyna, *Boott l c.* 7, t 22, *Boeck l c* 223 (*not of Turcz*).

HIMALAYA and W TIBET, N Sikkim, alt 12–17,000 ft, *J D H*, &c Kumaon, alt 10–13,000 ft, *Duthie*, &c Kunawur, alt 7–9000 ft, *Royle*, &c. Nubra, alt. 15–17 000 ft, *Thomson* —DISTRIB Central Asia

Glabrous, except spikes *Rhizome* short, no stolons seen *Stems* 8–30 in, unusually terete *Leaves* 4–20 by ⅛ in, weak, flat when dry *Spikes* sometimes 2½ by ⅓ in (or in some high-level Sikkim examples ½ by ⅓ in few-fld), chestnut-purple Fem *glumes* shorter than *utricle*, mucronate, dark chestnut with or without a broad green back, in the large Sikkim examples brown-pilose, in Royle's plant nearly (sometimes quite) glabrous *Utricle* ⅙–⅛ in, with few obscure nerves, usually browner upwards *Nut* oblong-obovoid, trigonous, obtuse, with short oblong apiculus.

132 **C. hirtella,** *Drejer Symb Caric* 21, leaves very narrow enrolled when dry, utricle ellipsoid lanceolate very long—otherwise as *C hæmatostoma*, Nees *Boott Carex*, i 11, t 31, *Boeck in Linnæa*, xli 209, *& in Journ Linn Soc* xviii 105 C. tenuis, *Nees in Wight Contrib* 128, *Kunth Enum* ii. 516

KASHMIR, alt 9–13 000 ft, very common KUNAWUR, *Royle* GURWHAL, alt 9–10,000 ft, *Duthie* (n 62)

The full form has utricles ¼–⅓ in long and is very marked, but eastern examples have smaller utricles, and are hardly distinguishable from *C hirtella* by their very narrow inrolled leaves The utricles in both species are triangular at tip without any definite beak, the terete stems, the much stalked nut, and the very hairy style are characteristic of both species The spikes in *C hirtella* are (usually) 3 male, 3–2 fem, the glistening margins of the glumes are sometimes very prominent, sometimes not more so than in *C hæmatostoma* and many sp

133 **C cardiolepis,** *Nees in Wight Contrib* 127, spikes 3–5 distant cylindric, terminal one male, fem glumes ovate truncate mucronate pale-backed, style 3 fid, utricles obovoid ellipsoid trigonous scabrous bristly suddenly narrowed into minute oblong beak *Kunth Enum* ii 516, *Strachey Cat Pl Kumaon,* 73, *Boeck in Linnæa,* xli 200 *& in Journ Linn Soc* xviii 105, *Boiss Fl Orient* v 409

N W HIMALAYA, alt 8–11,000 ft, frequent, from Kumaon to Kashmir —DISTRIB Cabul

Glabrous *Stems* 6–18 in, cæspitose on a tough short rootstock *Leaves* often nearly as long as stem, $\frac{1}{10}$ in broad, flat Lowest fem *spike* in fruit 1 by ¼ in,

filling utricle, style very short base slightly swollen, bracteas ...

134 **C. Halleriana,** *Asso Syn* 133, t 9, fig 2, ... one oblong cylindric male, fem 2 close to it short ... ovate green, style 3-fid, utricle somewhat large ... green minutely glandular pilose tip triangular shortly ... *Carex*, iv 128, tt 415, 416, *Boeck in Linnæa*, xli 201 ... *Allioni Fl Pedem* ii 270, *Kunth Enum* ii 473 ... *Dauph* ii 206, *Reichb Ic Fl Germ* viii 25 t 253 ... *Gram Austr* i 53, t 70

SIND, *Pinwill* — DISTRIB Westward to Europe Also ... America

Glabrous. *Stems* 6–12 in cæspitose on a harsh short rhizome ... many, often as long as stem, scarcely $\frac{1}{10}$ in broad Terminal male spike ... dense, pale brown Lowest fem *spike* rarely 1 in distant usually ... the upper fem, bract very short (Slender subbasal stems carry ... wholly female or male at top, there is no line to be drawn between this ... the common form of 1 male spike with 2 shorter female spikes at its base)

135 **C. læta,** *Boott Carex*, i 69, t 188, slender, spikes 2–3 distant cylindric terminal 1 male, fem glumes broadly obovate chestnut ... style 3 fid, utricle obovoid ellipsoid trigonous pilose tip short-... beakless *Boeck in Linnæa*, xli 199

SIKKIM HIMALAYA, Tungu, alt 12–13 000 ft *J D H*

Glabrous *Stems* 4–6 in, cæspitose on a small tough woody rootstock *Leaves* $\frac{1}{2}$–$\frac{3}{4}$ stem, $\frac{1}{12}$–$\frac{1}{10}$ in broad, flat Lowest fem *spike* $\frac{2}{3}$ by $\frac{1}{8}$ in, on peduncle ... bract sheathing, its free extremity very short Fem *glumes* very broad, tip ... pressed triangular, keel narrowly green *Utricle* scarcely $\frac{1}{10}$ in, terminated by a small round hole *Nut* obovoid triangular, filling utricle; style short — Boeckeler cites this as "C pellucida, Hook f et T Thoms, not of Turcz" *C pellucida*, Turcz, was never published, nor does Boeckeler say what it was the name was sent Boott (by Fischer on an example) who affixed it in ms. to Hooker's Turcz plant Turczaninow subsequently published his ms *C pellucida* as *C Kind* ... [Fl Baical Dahur, ii (pars 1) 275] it is very near indeed to *C læta* but has ... acute fem glumes, and Boott subsequently referred it to *C pediformis*, C A Mey

136 **C. setosa,** *Boott Carex*, iii 108, tt 327, 328, 329, spikes 2–6 distant slender cylindric, terminal one male, fem glumes elliptic acute or truncate, style 3 fid, utricle oblong obovoid trigonous setose narrowed rather suddenly into a short oblong scarcely notched beak *Boeck in Linnæa*, xli 303

... Kash...

... medium ... $\frac{1}{4}$ in broad ... $\frac{1}{4}$ in in the ... 2 3 in erect ... filiform wavy peduncles Fem *glumes* likewise vary from narrow ovate acute (in Sikkim) to truncate in Kashmir *Utricle* small, shining brown, with few scattered long fulvous setæ in Hooker's type plant (whence name *setosa*), in the perfectly ripe Kashmir plant utricles are green thin with rather copious short pubescence — The ...

examples since Boott (collected by Duthie) are intermediate between the Sikkim and Kashmir The Kashmir plant, both in the truncate glumes and utricles, is near *C cardiolepis*, Nees, but the spikes and utricles are much slenderer

137 **C. oligocarya,** *C B Clarke*, slender, spikes 4–1 terminal 1 male, fem spikes peduncled with 4–1 utricles, style 3 fid, utricle obovoid ellipsoid pilose suddenly narrowed into a long deeply notched beak.

and Asiatic few-utriculate species compared have all a much shorter beak than this

138 **C. breviculmis,** *Br Prodr* 242, slender, spikes 2–5 oblong rather small, terminal one male pale, fem with 8–14 utricles, fem glumes with long bristle much exceeding utricles, style 3 fid base dilated, utricle small ellipsoid trigonous slightly hairy tip pyramidal *Kunth Enum* ii 522, *Boott Carex* iv 181, *Boeck in* *in Wight Contrib* 127, *Kunth l c* 44 chlora, *Bunge in Petersb Mem Sav* *in Trans Linn Soc* xx 144 C pub 234

N-W HIMALAYA, alt. 6–10 000 ft, *Royle*, &c. SIND, *Pinwill* KHASIA HILLS, alt 4500–6300 ft. *C B Clarke* MUNEYPOOR, alt 6000 ft., *Watt.* NILGIRI HILLS, alt 7000 ft, *C B Clarke*—DISTRIB Japan, China, Austral, N Zealand

Glabrous, except utricles *Rhizome* creeping *Stems* cæspitose, 4–16 in *Leaves* often ½ stem, ⅛ in broad, flat *Spikes* usually approximate, subsessile, lowest fem sometimes 6 in distant on 2 in peduncle, fem ripe spikes ½ by ⅙ in *Style* at base dilated green, sometimes forming a button as in the nuts of *Eleocharis*

139 **C. nemostachys,** *Steud in Flora*, xxix 23 and *Cyp* 218, robust, stolons long, spikes 3–8 approximate long cylindric very dense, terminal one male, style 3 fid, female glumes linear caudate, utricle ovoid trigonous somewhat hairy beak long conic linear *Miq in Ann Mus Lugd Bat* ii 150, 211 C excurva *Boott Carex* i 57, t 150, *Boeck in Linnæa*, xli 245 C Zollingeri, *Boeck l c* 242 —Carex sp, *Griff Itin Notes*, 86 (n 1256)

KHASIA and Jaintea Hills, alt. 3–5000 ft, everywhere very common, *J D Hooker*, &c GARO HILLS, alt 1200 ft, *C B Clarke*—DISTRIB China, Japan

Glabrous, except utricles *Stolon* very long, stout *Stems* 3–1 ft, at top n, ¼ in broad, flat, margins *spike* sometimes 4½ by ⅕ in,) 3 by ¼ in, dense, appearing ...tions and the long persistent style-branches. Fem *glumes* from a very short triangular base, linear as long as utricles, finally whitening *Utricle* (beak included) about ⅙ in —An unmistakable pl...t that cuts severely

140 **C Wallichiana,** *Prescott in Wall Cat* 3380 glabrous except utricles stolons long leaves (all sub basal) long spikes 4–8 distant long cylindr c dense 3–1 term nal male style 3 fid utr cle ovo l ell pso d nearly to base into two lanceolate (1834) 129 *Kunth Enum* ii 483 *arex* 6 t 18 *Boeck in Linnæa Pl* 152 C Feda *Nees l c* 129 *Kunth Enum* i 483 C hirta *Boiss Fl Or ent* v 431 *Boeck in Journ Linn Soc* xvii 105 (*not of Linn*) —Carex *Wall Cat* 3390

N INDIA g nerally from Rawul l ndee *Aitch so* to BURMA *Gr ffith* an l from DELHI CANAL, a t 800 ft *Edgeworth* to S kk n alt 9000 ft *King* — D STRIB Cabul

Ste ns 6–30 n *Leaves* often ⅔ stem ¼ n broad s eatl s often fimbr ate Sp *kes* often 1½ n term al males pale rather tl k of en 3–2 somet mes 6–4 ra ely 1 fem ¼ n th ck ashy lo vest often 3 7 d stant o e ect peduncle bracts usually overtopp ng infl Fem *glumes* ovate acute often muc onate f iscous sl orter than utr cles *Utr cle* (beak cluded) ⅙–⅕ n long 8–10 nerv d teetl of beak ult mately wl ten ng spread ng—Un ted v th C *h rta* L un both by Boeckeler and Bo ss er to wh ch t s undoubtedly all ed *C h rta* d ffe s n tl e sl eaths (or the l gules at least) l a ry the m le sp ke s nalle the utr cles larger more acum nate nto a longer beak —*C Wall chiana* Boeck was founded pa tly on Falconer s n 1161 vh ch s *C l gulata* Nees

141 **C ligulata,** *Nees in Wight Contrib* 127 stems w th nodes and leaves throughout the r length leaves ⅛–¼ in wide sp kes 6–8 cylindric distant terminal one male s ender style 3 fid utr cle densely ha ry ovo d a uminate into a short 2 fid beak *Kunth Enum* ii 516 *Strachey Cat Pl Ku naon* 73 *Boott Carex* i 45 t 113 *Boeck in L nnæa* xli 305 C brevicnlm s *Thw Enu n* 355 *not Br*) C Thwa tesi *Hance n Journ Bot* v 235 (*cf Tri nen Cat Pl Ceylon* 104) C Wall ch ana *Boeck in Linnæa* xl 310 (*partly not of Prescott*) C lachnosperma var β major *Nees in Wall Cat* 33 9 (*partly*) (3373 β *Wall Herb propr*) — Carex *Wall Cat* 3394 (second sheet)

KASHMIR *Falconer* to NEPAL *Wallich* alt 5–7000 ft KHASIA HILLS alt 5-6000 ft *Gr ffit! C B C a ke* NILGIRI HILLS alt 5–7000 ft. *C B Clarke* CEYLON alt 4–5000 ft *Thwa tes*—DISTRIB Cl na Japan

Sheaths and *lea es* (par ly) m nu not th ck *Stems* 12 30 n Lower stem about as long as nfl flat str at *spikes* 1½ by ½ n erect on s o t pe acute mostly muc onate shorter tl an utr c es *Utricle* (b ak nclud d) $\frac{1}{10}$ n

142 **C. hebecarpa,** *C A Meyer in Petersb Mem Sav Etrang* i. 2 3 t 12 leaves and lo ver bracts very close together scarcely ⅛ in. broad much overtopping infl fem sp kes slender with d stant utricles fem glumes whitening (otherwise as *C ligulata* Nees) *Kunth Enum* ii. 4 1 *Boeck in Linnæa* xli 301 C Wallich ana *C B Cla ke in Journ. L nn Soc* v 25 83 *partly not of Prescott*) C lacl nosperma, *Wall Cat* 3379 A

NEPAL *Wall ch* MUNEYPOOR alt. 5800 ft *C B Clarke*
Beak of ut cle rather longer and slenderer than n *C l gulata* Nees

Var β *lachnosperma* (sp) *Nees in Wight Contrib* 124 (*excl syn*) leaves close together ¼ n broad fe n sp kes dense ⅛–¼ n broad *Kunth l c* *C K* *Drejer Sy nb Caricol* 22 C grac l s *B ott Carex* i 53 (*partly*) C. *Boott l c* 45 t 114 C. l gulata *Nees* var m nor and angust

NEPAL, *Wallich* KHASIA HILLS alt 4500 ft *Griffith* (*Kew Distrib* 6063) *J D H* MUNNYPOOR, alt 4000–5000 ft, *C B Clarke*—DISTRIB Cochin China

Appears exactly intermediate between *C ligulata*, Nees and *C hebecarpa*, C A
in Wallich
This raises
Nees, and C
by the inter-
gracilis, he

UNDETERMINED INDIAN CAREX

1 C AITCHISONI, *Boeck in Flora*, lx ii 456 Kurrum Valley (British Afghanistan), *Aitchison* Allied to *C microlepis* Boeck & *C punctata*, Gaud, *fide Boeckeler*

2 C CYLOCISTIS *Boeck Cyp Nov* I 47 Tibet, *Schlagintweit*, n 8860 (*partly*) and (n 7015) Allied to *C pulla*, *fide Boeckeler*

3 C DIMORPHA, *Boeck l c* 45 W Himalaya, *Schlagintweit* n (4175) Allied to *C alpina*, *fide Boeckeler*

4 C EXIGUA, *Boeck in Engl Jahrb* v 514 Ceylon, *Wichura* (n 2690) Allied

5 piti, *Schlagintweit* (n 69,

6 , *Schlagintweit* (n 1642)

7 6088) Allied to *C fuliginosa*, *C frigida fide Boeckeler*

8 C MACRANTHA *Boeck l c* 49 Tibet, *Schlagintweit* (n 7017) Allied to C

(*partly*)

, *Schla-*

Allied

W Himalaya, *Schlagintweit* (n 8643)

, *Schlagintweit* (n 6960) Allied to C

14 C
gintweit) n

15 C
gintweit (n

LASIOLEPIS *Boeck* (in Flora lvi
its author to *Cyperaceæ*, is, as pointe
Eriocaulon The description of the
plete for identification with any pre
several common ones

INDEX OF GENERA, SPECIES AND SYNONYMS.

The Synonyms and Species incidentally mentioned are printed in italics

* Err. typ. for *Cnemidia curculigoides*, read *Tropidia curculigoides*.